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NSA CRANE
5090.3a

WORK PLAN FOR TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN FOR INTERIM
MEASURES CLEANUP SOLID WASTE MANAGEMENT UNITS 16/16 AND 24/00 NSWC
CRANE IN
8/18/1995
MORRISON KNUDSEN CORPORATION

28

WORK PLAN
AND
TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN
FOR
INTERIM MEASURES CLEANUP
AT
SOLID WASTE MANAGEMENT UNITS
#16/16 and #24/00

NSWC CRANE
Crane, Indiana

CONTRACT #N62467-93-D-1106
DELIVERY ORDER #0009
STATEMENT OF WORK #007

August 18, 1995
Revision B

Prepared for:

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**WORK PLAN
FOR
INTERIM MEASURES CLEANUP
AT
SOLID WASTE MANAGEMENT UNITS
#16/16 and #24/00**

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**REVISION B
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12

NAVAL SURFACE WARFARE CENTER
CRANE WORK PLAN

SOLID WASTE MANAGEMENT UNITS
#16/16 AND #24/00

NSWC CRANE
CRANE, INDIANA

August 18, 1995
Revision B

CONTRACT N62467-93-D-1106
DELIVERY ORDER #0009

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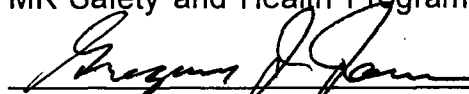
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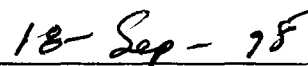
MK Safety and Health Program Manager



Date



MK Quality Program Manager



Date



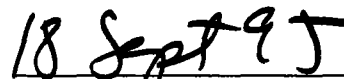
MK Sr. Project Manager



Date



MK Program Manager



Date

ACCEPTANCE



U.S. Navy Responsible Authority



Date

CRANE WORK PLAN

**for
Solid Waste Management Units
#16/16, and #24/00**

**NSWC CRANE
Crane, Indiana**

**Contract No. N62467-93-D-1106
Delivery Order 0009**

**Revision B
August 18, 1995**

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1.0 INTRODUCTION

The Naval Surface Warfare Center (NSWC) Crane is located in southwestern Indiana, see Figure 1-1, and provides support for equipment, shipboard weapons systems, and ordnance. In addition, NSWC supports the Crane Army Ammunition Activity (CAAA) including production and renovation of conventional ammunition, storage, shipment, and demilitarization and disposal of conventional ammunition.

This Work Plan has been prepared by Morrison Knudsen (MK) for the Naval Facilities Engineering Command (NAVFACENGCOM), Southern Division pursuant to the scope of work defined in Delivery Order #0009, under Contract #N62467-93-D-1106. This Work Plan describes the methods to be used to perform the interim measure cleanup required by the scope of work for two Solid Waste Management Units (SWMUs): #16/16 Cast High Explosive/Incinerator Building 146 and #24/00 Sludge Drying Beds A & B. The SWMUs' locations are shown in Figure 1-2.

1.1 SWMU #16/16, CAST HIGH EXPLOSIVE/INCINERATOR BUILDING 146

The Cast High Explosive area is located in the north central part of NSWC as shown on Figure 1-2. Building 146 is situated along H-307 and was the site for melt-pouring TNT, RDX, and HMX explosives into projectiles (cast loading). High-pressure water washout of 5-inch projectiles filled with Composition A was also conducted at Building 146. Prior to 1978, the generated waste water was discharged to a storm drain, with release to a ditch and ultimately Boggs Creek. Beginning in 1967, small-arms ammunition was demilitarized in three incinerators located adjacent to Building 146. Incinerator ash collected in the emission controls system was stockpiled on the surface soil prior to disposal (Halliburton 1994). Scattered small piles of potentially contaminated ash and slag are visible throughout the area.

Two settling basins are located near the northeast and northwest corners of Building 146, as shown in Figure 1-3. These basins are thought to accept discharge from the floor drains inside the building (Halliburton 1994). These settling basins (sumps) are constructed of concrete, with wood slats covering the tops. Each sump measures approximately 13 feet long by seven feet wide by seven feet deep. The bottom of a 12-inch diameter discharge pipe is located approximately three and one-half feet from the bottom of the sumps. The discharge areas will be sampled for potential soil contamination. Figure 1-3 shows the location of the Building 146 sumps as well as the affected soil area.

The major soil contaminants resulting from Building 146 loading and washout activities were TNT, RDX, HMX, Composition A, Composition B, and ammonium picrate. The main compounds of concern in the incinerator ash are lead, barium, cadmium, chromium, and mercury. Potential contamination from PCB oxidation products resulting from fuel blending at the incinerator has also been reported (Halliburton 1994).

1.2 SWMU #24/00, SLUDGE DRYING BEDS A AND B

1.2.1 Sludge Drying Beds A

The Sludge Drying Beds A are located in the east central section of NSWC at the sewage treatment plant at the intersection of H-15 and H-514, as shown in Figure 1-4. The sludge beds have processed sludges from industrial waste water treatment systems as well as sanitary sewer treatment systems and are potentially contaminated with compounds such as metals, pesticides, and herbicides.

This portion of the SWMU consists of a large cell with concrete walls 8 inches thick and 5 feet-8 inches deep to the bottom of the footer (BOF). This cell measures 80 feet-8 inches wide by 51 feet-4 inches long and is divided into three separate sludge beds by two 8-inch concrete walls, 5 feet-8 inches BOF. The individual sludge beds are 26 feet wide by 50 feet long (inside dimensions). Each bed base is earthen lined with two 6-inch vitrified clay pipes traversing the entire length, covered with a 5-inch layer of coarse gravel, a 5-inch layer of fine gravel, and finally a 12-inch layer of sand.

A sludge slurry is deposited in the beds from a 6-inch cast iron manifold with isolation valves for bed selection. The inlet pipe and valve manifold is located on the north end of the sludge beds and enters the bed at approximately 6 inches down from the top of the bed walls. The outlet pipe of the beds exit at the south wall approximately 5 feet deep (top of footer) and tie into a 10-inch interceptor sewer line which drains to the sewage treatment system.

Each bed is provided with concrete drive pads which traverse the length of the bed for truck access to remove dewatered sludge.

1.2.2 Sludge Drying Beds B

The Sludge Drying Beds B are located in the northwest section of NSWC, just outside of the Crane Gate (Gate #4) on H-498 off of H-5, as shown in Figure 1-5. These sludge beds also processed sludges from industrial waste water treatment systems as well as sanitary sewer treatment systems and are potentially contaminated with compounds such as metals, pesticides, and herbicides (MK 1994).

This portion of the SWMU consist of a smaller cell with 8-inch concrete block walls, two feet-8 inches deep BOF. This cell measures 51 feet-4 inches wide by 51 feet-8 inches long and is divided into three separate sludge beds by two 2-inch concrete block walls, 2 feet-8 inches BOF. The individual sludge beds are 19 feet-8 inches wide by 50 feet-4 inches long (inside dimensions). Each bed base is earthen lined and covered with a layer of gravel. These beds have not been in service for a significant time period; they are overgrown with vegetation and have badly deteriorated walls.

The sludge feed pipe enters the beds from a valved manifold on the north side of the cell. The effluent piping is on the south side of the beds; however, no details are available on this piping which is thought to discharge to the creek.

1.3 OBJECTIVES

MK's goal is to cost-effectively and efficiently execute the work in accordance with the Delivery Order requirements while meeting or exceeding all site-specific, local, state, and federal requirements. The primary work objectives are to:

- Perform all work in a manner that maximizes worker safety and minimizes environmental impacts.
- Remove, test, and dispose of the ash\slag piles at the High Cast Explosive area, and restore the site by backfilling the excavation to the original grade.
- Remove and test the sludge at Drying Beds A & B, use a high-pressure wash to clean concrete in the drying beds, and restore soil excavated from the bottom or sides of the beds. If the removed sludge tests non-hazardous, it will be used as fill in the beds. Sludge Drying Beds A are currently in use and will be restored for continued use after remediation. Sludge Drying Bed B will be removed, the underlying soils sampled, the concrete walls removed, backfilled, and the area regraded. Remediation activities will minimize the impacts to the operating facility.

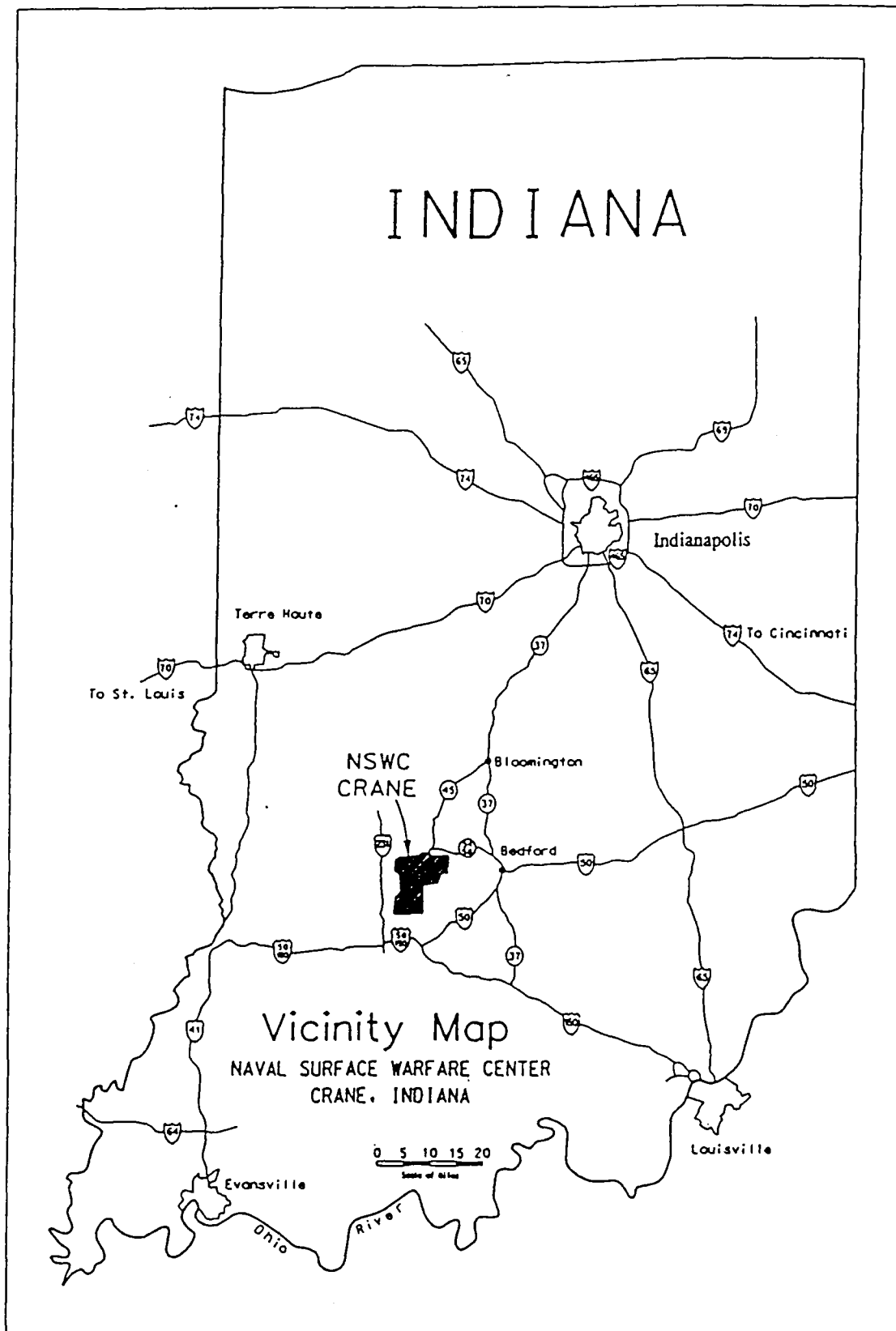
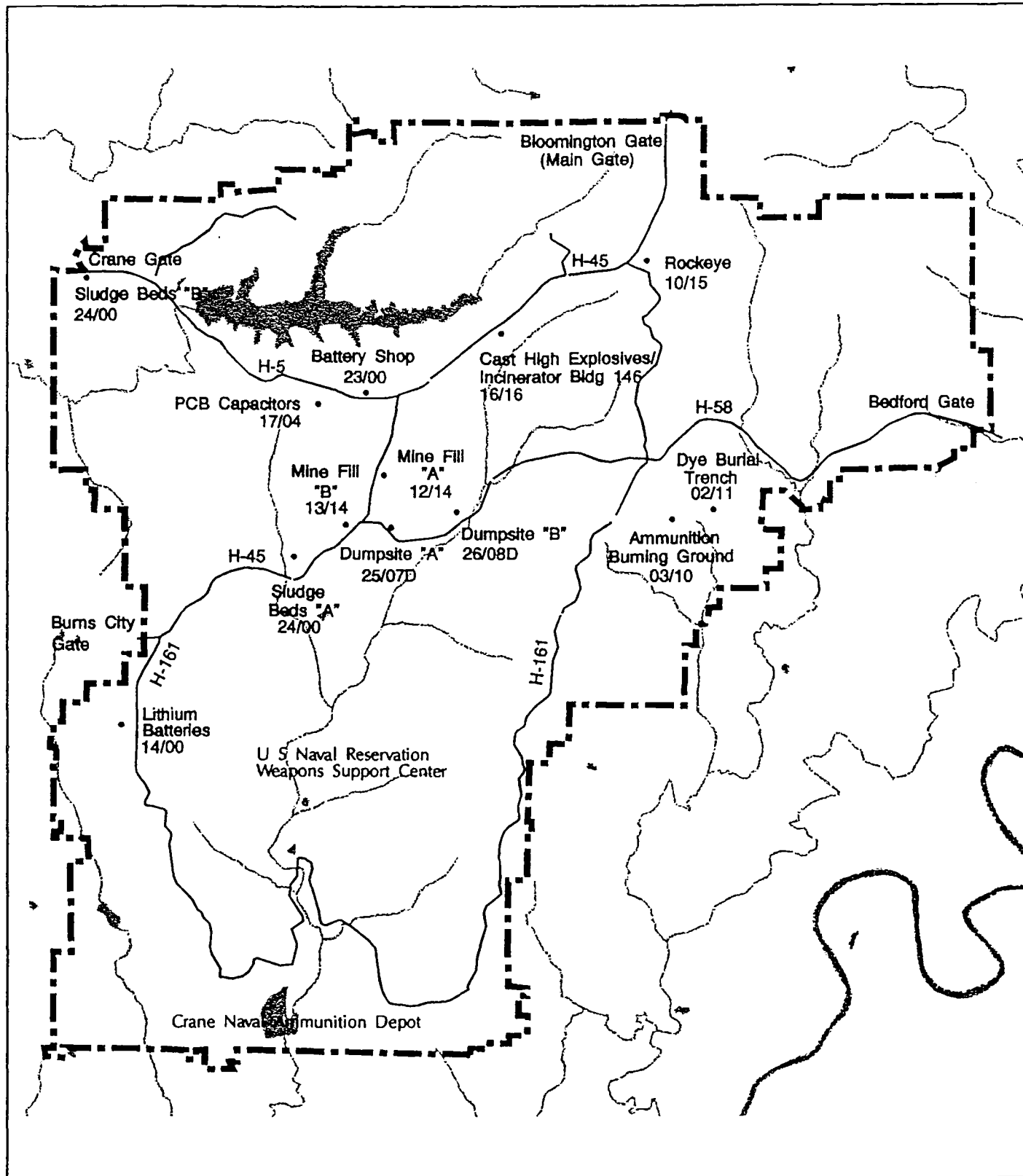


Figure 1-1
Vicinity Map of NSWCR Crane, Indiana



- | | |
|--------|--|
| 02/11 | Dye Burial Ground |
| 03/10 | Ammunition Burning Ground Area |
| 10/15 | Rockeye |
| 12/14 | Mine Fill A |
| 13/14 | Mine Fill B |
| 14/00 | Sanitary Landfill and Lithium Battery |
| 16/16 | Cast High Explosives Fill/Incineration complex |
| 17/04 | PCB Capacitor Burial/Pole Yard |
| 23/00 | Battery Shop |
| 24/00 | Sludge Drying Bed A |
| 24/00 | Sludge Drying Bed B |
| 25/07D | Highway 58 Dump Site A |
| 26/08D | Highway 58 Dump Site B |



Figure 1-2
Location of Solid Waste
Management Units

0.5 1 1.5 2 2.5 MILE



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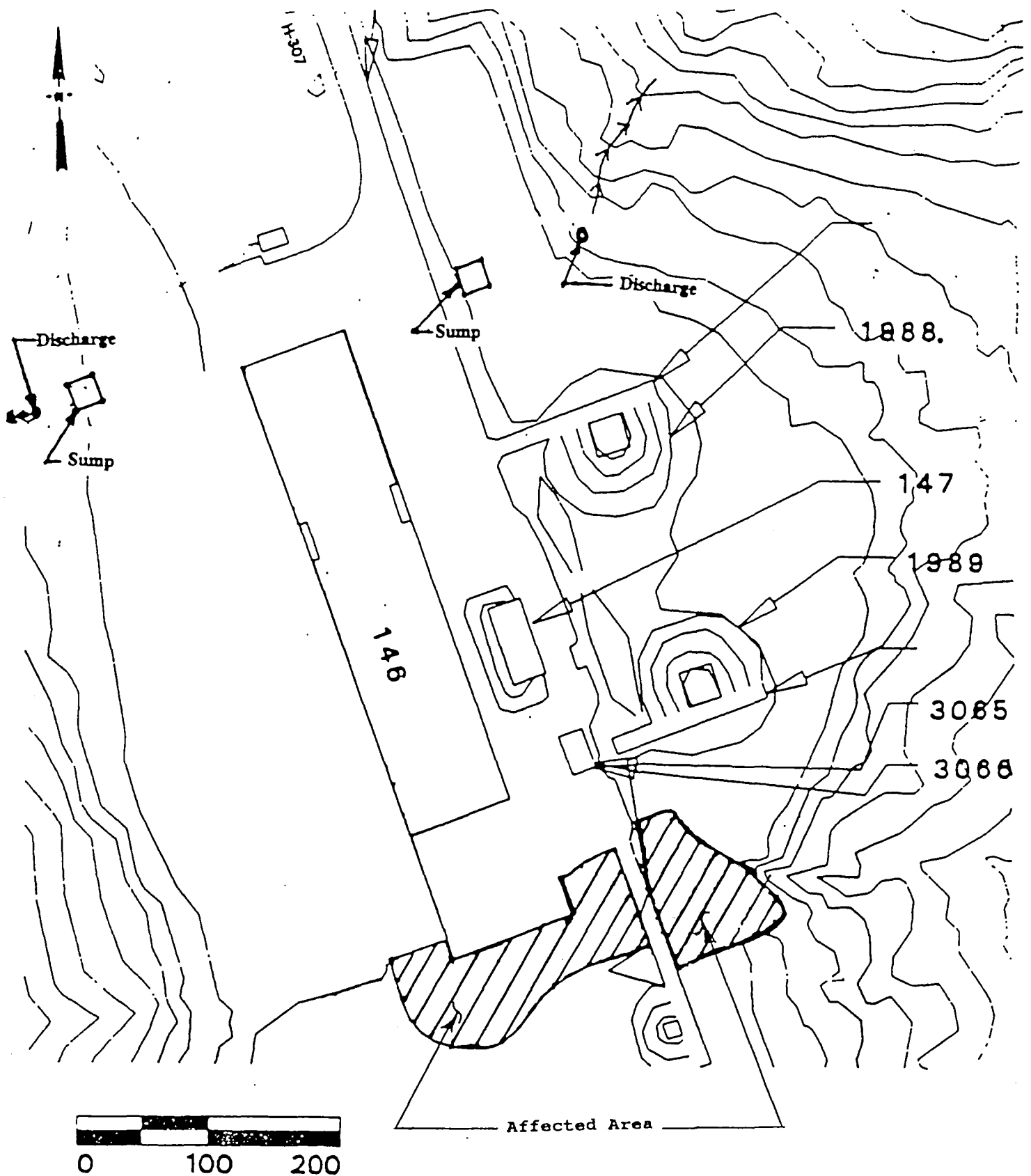


Figure 1-3
SWMU #16/16 Cast High Explosive/Incineration Soil Excavation Area

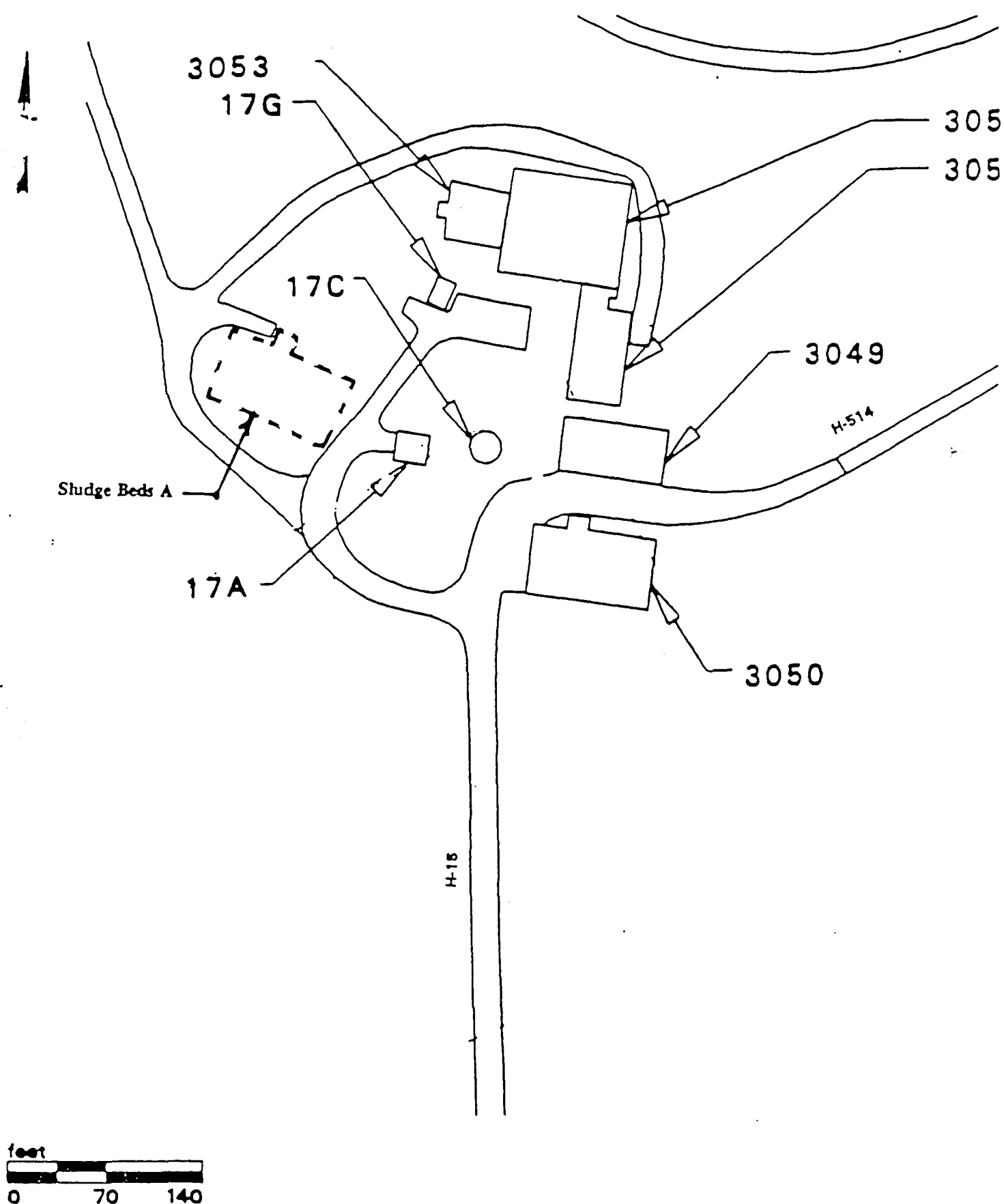


Figure 1-4
SWMU #24/00 Sludge Drying Bed A Excavation Area

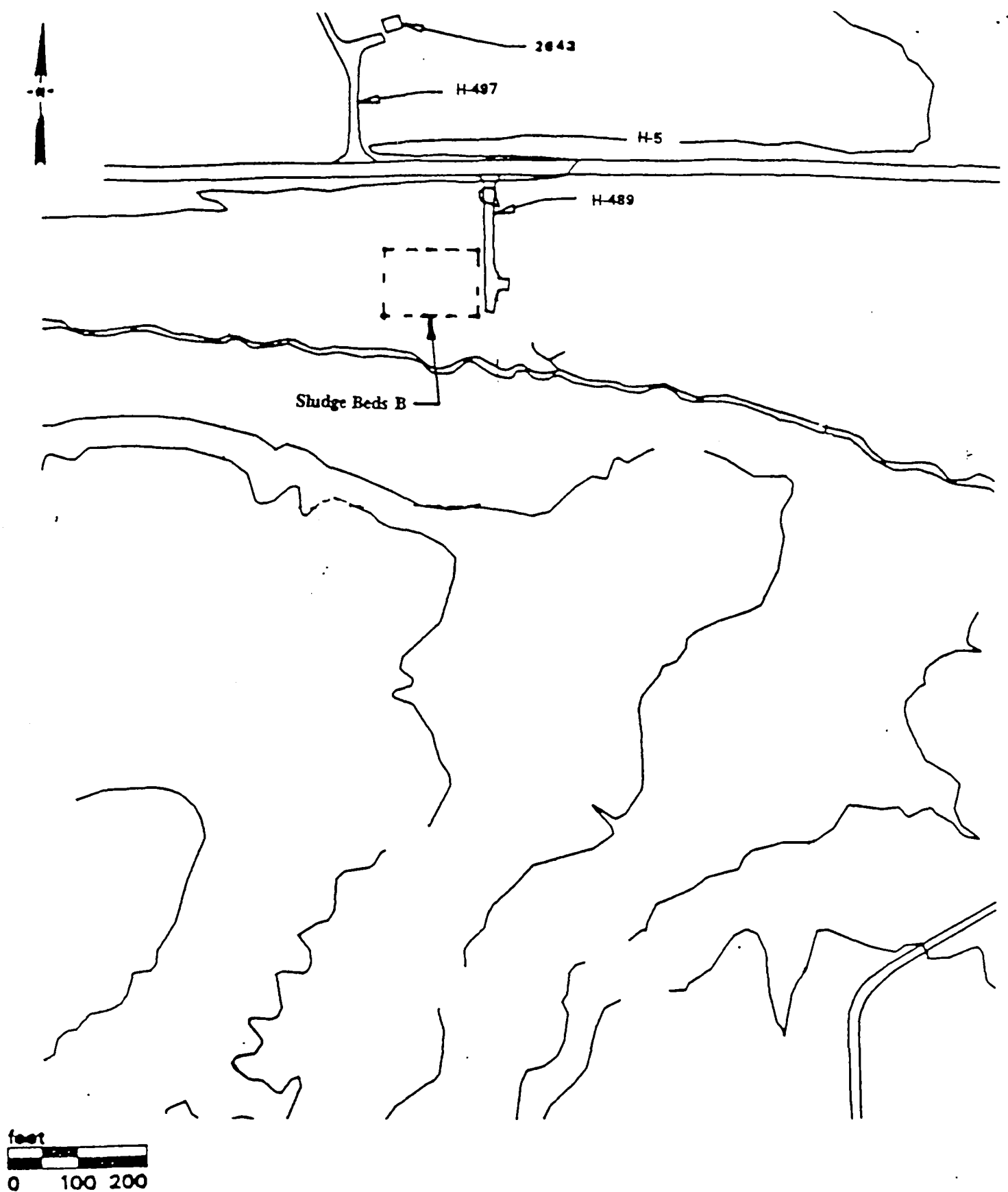


Figure 1-5
SWMU #24/00 Sludge Drying Bed B Excavation Area

2.0 ENVIRONMENTAL COMPLIANCE

Promulgation of the Environmental Protection Agency's (EPA's) regulatory program under the Resource Conservation and Recovery Act (RCRA) provided the impetus to identify and control environmental contamination from past practices at NSWC Crane. On December 23, 1989 the EPA issued the federal portion of the final RCRA permit for NSWC Crane to the U.S. Navy. This permit established the Hazardous and Solid Waste Amendment (HSWA) Corrective Action Requirements and Compliance Schedules obligating the U.S. Navy to perform RCRA Facility Investigations (RFIs) at 30 SWMUs, to conduct Corrective Measures Studies, and implement corrective measures if needed.

2.1 REGULATORY COMPLIANCE

The following regulations, guidance, and procedures may affect the work at SWMU #16/16 and SWMU #24/00:

- U.S. Navy or NSWC Crane guidance
- U.S. Occupational Safety and Health Administration
 - 29 CFR 1910, Occupational Safety and Health Standards
 - 29 CFR 1926, Safety and Health Regulations for Construction
- U.S. Army Corps of Engineers
 - EM-385-1-1, Safety and Health Manual
- U.S. Environmental Protection Agency
 - 40 CFR 261, Identification and Listing of Hazardous Waste. Compliance will be required to characterize the waste.

40 CFR 262, Regulations for Hazardous Waste Generators. Compliance may be required with Subpart C for accumulation, packaging, labeling, marking, and placarding requirements and with Subpart B for manifest requirements.

40 CFR 264, Regulations for Owners and Operators of Permitted Hazardous Waste Facilities. Compliance with the following Subpart may be required:

Subpart I, Use and Management of Containers. Compliance with this subpart may be required for management of all hazardous waste containers.

40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions. Compliance will be required for any PCB-contaminated soils and capacitors. In particular, Subpart C, Marking, and Subpart D, Storage and Disposal, must be followed in handling the PCB soils and capacitors.

- Indiana Department of Environmental Management
329 IAC 3.1-6, Identification and Listing of Hazardous Waste. This regulation incorporates by reference the federal regulations with a few additions.

329 IAC 3.1-7, Standards Applicable to Generators of Hazardous Waste. This regulation incorporates by reference the federal regulations with a few changes and additions.

329 IAC 3.1-9, Final Permit Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. This regulation incorporates by reference the federal regulations with a few changes and additions.

- U. S. Department of Transportation
49 CFR 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements. This part describes requirements for completing shipping papers; marking, labeling, and placarding; training; and emergency response.

49 CFR 173, General Requirements for Shipments and Packaging. This part describes classification and packaging of hazardous materials.

All waste products from the activities in this Work Plan will be disposed of as described in the Waste Management Plan (WMP) in compliance with federal and state hazardous waste regulations. The state regulations incorporate the federal regulations with few exceptions. However, particular attention should be paid to the state manifesting requirements.

Off-site transportation of any hazardous waste or material requires compliance with the DOT hazardous material transportation rules. The particular requirements are listed in the WMP. The Site Shipping Officer (SSO) will coordinate the shipping effort. MK will not sign any manifests.

All excavations must comply with the NSWC Crane site requirements. MK subcontractors will notify MK, and MK will in turn notify the NSWC Crane Site Representative of all construction activities as outlined in Section 2.2 below.

2.2 PERMITS, APPROVALS, AND NOTIFICATIONS

Several permits, approvals, and notifications will be required for implementing the Work Plan interim measures cleanup activities and are summarized in the following sections.

2.2.1 Construction Permits

The NSWC Crane facility requires issuance of construction permits before construction initiation. An Excavation and Trenching Permit will be required for each area and will include a statement of clearance for safe access based on the removal or absence of unexploded ordnance in the work zone. The MK Project Manager (PM) will be responsible for obtaining this permit through the Public Works Department, Building 2516. Preparation of the application and associated drawings should be started as soon as possible to allow time for review and approval.

2.2.2 Notifications

All federal, state, and local agency notifications will be performed by the NSWC Crane Site Representative. All MK subcontractors will notify the PM and the PM will in turn notify the NSWC Crane Environmental Protection Department of all interim measures cleanup activities. These notifications include, but are not limited to:

- Clearing and grubbing.
- Trenching and excavation.
- Backfilling and compaction.
- Storage and handling of hazardous materials.
- Inspection, manifesting, and shipping of hazardous materials.
- Construction activities.

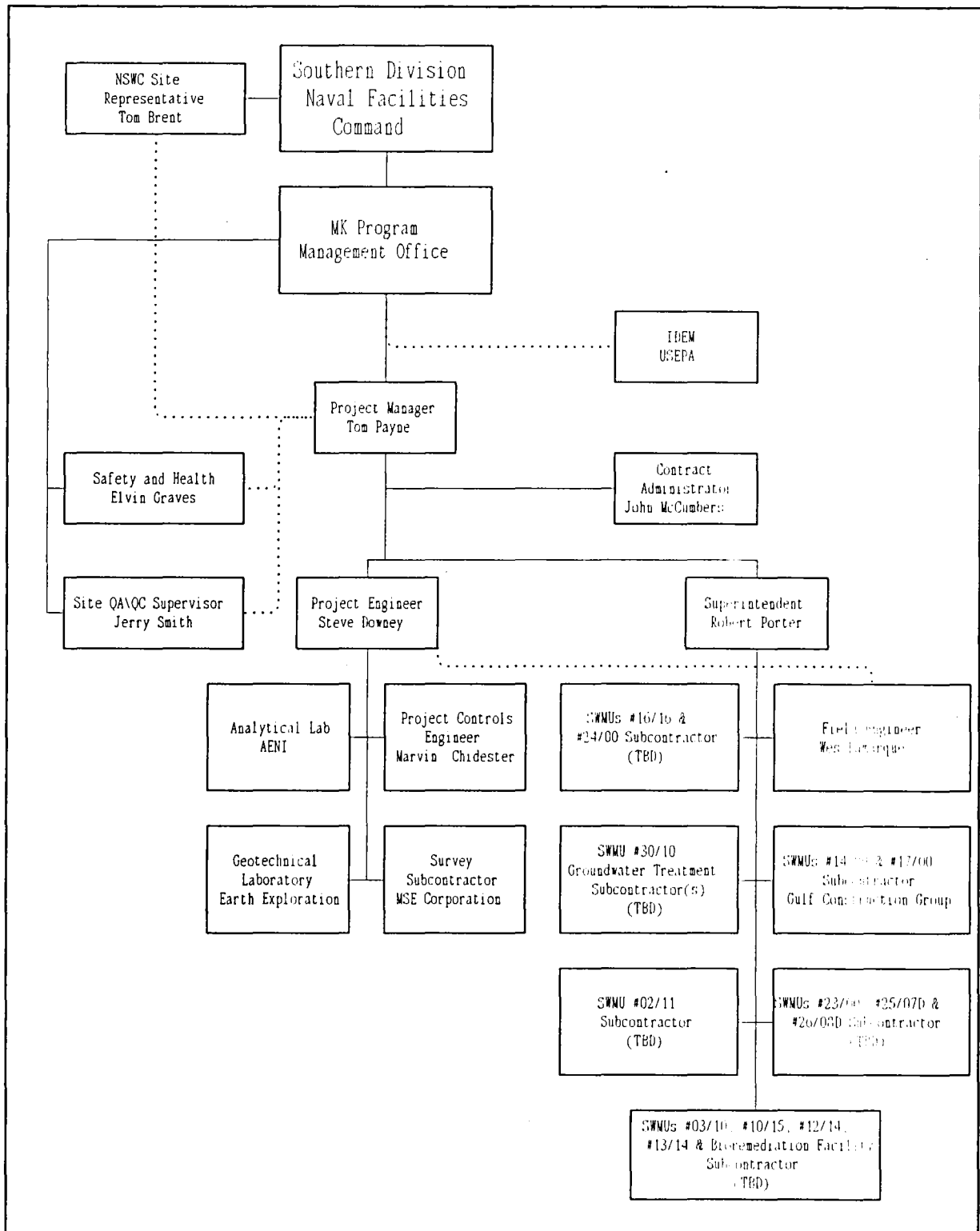
If Corrective Action Management Units (CAMUs) are not available, or not accessible, the MK Project Manager will ask the NSWC Crane Environmental Protection Department to request permission from the EPA to temporarily stockpile soils as described in this Work Plan. If permission is denied, the soils must be sampled before they are excavated.

During interim measures cleanup activities, as described in this Work Plan, emergency notifications will be required in case of fire, explosion, or spills. Notifications shall be made according to the Emergency Response Plan as described in the Task-Specific Site Safety and Health Plan (SSHP) for this Work Plan.

3.0 PROJECT ORGANIZATION

The project team organization for this Delivery Order is shown in Figure 3-1. The responsibilities of each team member are listed in Table 3-1.

The team is structured to provide the maximum flexibility and efficiency in the execution of this Delivery Order. This flexibility and efficiency will facilitate changes that may occur in the related scope of work.



**Figure 3-1
Organization Chart**

**Table 3-1
Project Responsibilities**

TEAM MEMBERS	RESPONSIBILITIES
NAVFACENGCOM Southern Division	Overview of project execution and coordination between Contractor, NSW Crane, and other agencies.
Program Management Office (PMO)	Overall responsibility for all cleanup measures at all sites in the Southern Division of the Naval Facilities Engineering Command under Contract No. N62467-93-D-1106. The PMO is the point of contact for NAVFACENGCOM.
NSWC Site Representative	NAVFAC's on-site representative and is the liaison between NSWC officials and the Project Manager for the SWMUs at NSWC Crane.
Project Manager (PM)	<p>Overall responsibility for implementing this Work Plan and all other project activities. The PM will control all on-site forces to ensure completion of project tasks.</p> <ul style="list-style-type: none"> • Single point of contact for NAVFACENGCOM liaison. • Coordinates the project resources to ensure compliance with the appropriate plans, procedures, and regulatory requirements, • Oversees all personnel on-site and coordinates with the Program Management Office (PMO).
Project Engineer (PE)	<p>Reports to the PM and will act as the Assistant Project Manager. Specific responsibilities include:</p> <ul style="list-style-type: none"> • Supervises the activities of the project field staff (regulatory specialists, geologists, field engineers, etc.). • Coordinates with the Site Superintendent to ensure that activities are properly coordinated between subcontractors. • Coordinates the activities of the support staff and provides project status reports to the PM. • Maintains project records and prepares technical scopes of work for subcontractors. • Directs the efforts of technical subcontractors (i.e., surveying, sampling and testing).
Cost and Schedule Engineer	<p>Reports to the PE and has primary responsibility for the maintenance of the cost and schedule control systems, including regular assessments of performance.</p> <ul style="list-style-type: none"> • Provides administrative support services. • Evaluates cost and schedule information and provides status reports. • Prepares monthly progress reports. • Reviews cost/schedule submissions by subcontractors. • Verifies progress against payment requests. • Maintains the document control system. • Maintains contract change notice log and trend logs.

**Table 3-1
Project Responsibilities**

TEAM MEMBERS	RESPONSIBILITIES
Contract Administrator	<p>Provides administrative support to the technical staff for contractual and procurement activities.</p> <ul style="list-style-type: none"> • Prepares subcontract bid packages. • Issues and provides support in the administration of subcontracts. • Monitors SB/SDB compliance. • Monitors purchase orders.
Site Safety and Health Officer (SSHO)	<p>Reports to the PMO. Implements and ensures compliance with the Task-Specific Site Safety and Health Plan (SSHP). Tracks and reports on safety-related matters.</p> <ul style="list-style-type: none"> • Responsible for the control and elimination of existing and potential industrial hazards. • Implements and executes personnel monitoring program to ensure proper monitoring of internal and external exposures. • Provides site-specific training to personnel as required by the SSHP. • Tracks all personnel training requirements, survey data, certifications, and records to ensure compliance with plans and regulations. • Assists in developing and implementing the SSHP. • Reviews and approves subcontractor Safety and Health Plans and Programs. Conducts audits as appropriate to ensure compliance. • Reviews and approves work permits for appropriate industrial hygiene and safety controls. • Provides monitoring to ensure the protection of project personnel, the public, and the environment, • Maintains an inventory of industrial hygiene and safety supplies as appropriate. • Maintains monitoring equipment and calibration records. • Stops work when necessary to ensure the safety of personnel and to prevent damage to the environment.
Site Superintendent	<p>Reports to the PM and has primary responsibility for the coordination and control of all field activities to ensure that all tasks included in this Work Plan are completed.</p> <ul style="list-style-type: none"> • Coordinates the activities of all subcontractors. Directs all subcontractors together with the PE. • Provides daily reports to the PM and PE on the status of field activities.

**Table 3-1
Project Responsibilities**

TEAM MEMBERS	RESPONSIBILITIES
Site Quality Control Officer (SQCO)	<p>Reports to the PMO and has primary responsibility for verifying a consistently high level of quality for the project.</p> <ul style="list-style-type: none"> • Reviews and checks all documents, reports, and testing results. • Coordinates with procurement, engineering, and cost/schedule departments. • Observes all field activities to ensure compliance with this Work Plan and the QAPP and completes Field Inspection Checklists (Appendix A). • Keeps minutes of the periodic quality meetings. • Implements the three phases of quality control: Preparatory, Initial, and Follow-up inspections. • Ensures tracking and resolution of nonconformance/rework items.
Note: See Section 3 of the Task-Specific Site Safety and Health Plan for names and contact.	

4.0 PROJECT EXECUTION

This section details the work for the two SWMUs covered by this Work Plan. Unexploded Ordnance (UXO) clearances, excavation permits, hot work permits, and other required approvals will be obtained before performance of any field work beyond visual survey and walk arounds. All activities will also be coordinated with operations activities near the work areas. These clearances, permits, and approvals will be obtained from the NSWC Site Representative.

4.1 SWMU #16/16 CAST HIGH EXPLOSIVE/INCINERATION BUILDING

4.1.1 Work Scope

The scope of work includes removing, sampling, and disposing of sludge; removing, sampling and disposing of ash/slag piles; confirmation sampling of remaining soils; cleaning two sumps; and backfilling and restoring the excavated area. Figure 1-3 shows the general site location and access.

4.1.2 Site Assessment

The NSWC Crane Site Representative will determine if a UXO survey is necessary. If the potential exists for encountering explosive ordnance in the work area, NSWC Crane will perform a surface UXO survey to identify and remove any unexploded ordnance. The area will be surveyed and located in relationship to existing monuments. Data will be collected to create a topographical map of the site and to verify the quantities of material to be excavated. Permits will be obtained for all site activities and mobilization will begin. Preliminary information indicates that 50 cubic yards of contaminated material and 1 cubic yard of sludge may need to be excavated and disposed (MK 1994).

4.1.3 Mobilization

The initial steps in mobilization will be to prepare the Environmental Condition Report and for the subcontractor to define the configuration of the work area including the boundaries of the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ) with appropriate decontamination stations, the Support Zone (SZ), and access routes. The work zones and access routes will be established. Tools, equipment, and supplies will be delivered to the site and personnel mobilized.

The subcontractor will steam clean and inspect all equipment before shipment to the site. The contractor will inspect the equipment for the presence of dirt, oils, and grease. The general condition of the equipment will be inspected and tested to ensure that all safety systems and alarms are functional. The performance of the equipment will be tested to determine if the equipment can perform the required tasks.

4.1.4 Removal of Sludge

After sample screening, in accordance with Section 4.1.6, the sludge will be removed from the sumps. Based on the results of the screening samples, the sludge will be dispositioned as contaminated or noncontaminated. Noncontaminated sludge will be disposed of as nonhazardous waste or used as fill. Contaminated sludge will be containerized in roll-offs. Sludges with contaminants in excess of those levels in Tables 5 and 6 of the Sampling and Analysis Plan (SAP) will be transported to an off-site disposal facility. Identifying, packaging, labeling, and transporting hazardous materials will be performed in accordance with the Waste Management Plan.

The sump walls will be cleaned by a high-pressure wash. The walls will not be sampled to confirm removal of contamination, but a visual inspection will be performed. The sump will be considered clean when no residue remain on the concrete surfaces.

Contaminated wash water from the sump wall cleaning process will be collected, sampled, and disposed of as required.

4.1.5 Excavation of Ash/Slag Piles

Based on the visual inspection of the site, the ash/slag piles will be identified, excavated, and placed in roll-offs for sampling and characterization. After a pile has been excavated, confirmation sampling will be performed to determine whether the excavated area is below the contaminant levels listed in Tables 5 and 6 of the SAP. Sampling and analysis requirements are described in Section 4.1.6 below.

4.1.6 Sampling and Analysis

Sump Sludge Sampling. The purpose of sludge sampling at Cast High Explosive/ Incinerator Building 146 is to determine if the sludge contains concentrations of explosive compounds or Appendix IX metals above cleanup levels listed in Tables 5 and 6 of the SAP. The sludge from each sump will be sampled and analyzed according to the following procedure.

An initial sampling will be performed to verify levels of explosives and determine if PCBs are present. To do so, a 2-inch diameter or larger sampling tube will be pushed or drilled into the sump sludge until the bottom is reached. The tube will be removed and split open to expose the sample. Field screening analysis for TNT, RDX and PCBs will be conducted at 1-foot intervals along the sample. Field sampling and screening procedures are described in the SAP.

The roll-off will be quartered and a sample shall be taken from each quadrant. A composite will be formed by combining an equal weight of soil from each of the four samples. This composite sample will be analyzed to characterize the material for disposal.

Soil Sampling. The purpose of the soil sampling effort at Cast High Explosive/ Incinerator Building 146 is to determine whether the soil contains concentrations of explosive compounds, Appendix IX metals, or PCBs above cleanup levels listed in Tables 5 and 6 of the SAP.

After the ash/slag piles have been removed, a minimum of 1 confirmation sample for each excavation or per 100-square-foot grid of excavated area shall be taken and analyzed for Appendix IX metals, explosives and PCBs. These soil samples will be taken from the bottom of each excavation. Details of the sampling techniques and analytical requirements are described in the SAP.

Soil/slag materials excavated and stored in roll-offs will have a composite sample taken from each container. The container will be divided into quadrants and one sample will be taken from 1 to 2 feet down from the surface in each quadrant. A composite will be formed by combining equal weights from each sample. The composites will be analyzed to characterize the materials for disposal.

4.1.7 Hazardous Waste Packaging, Transportation, and Disposal

Contaminated materials classified as RCRA hazardous will be packaged, labeled, and placed in temporary storage for no longer than 90 days from the date of being excavated or generated. A licensed hazardous waste transporter will be contracted to ship the materials to a Treatment, Storage, and Disposal (TSD) Facility permitted for the type of material as determined by the analytical results of the sampling. Manifests shall be prepared and presented to the NSWC Site Representative for signature. Hazardous wastes will be packaged, labeled, and transported in accordance with the Waste Management Plan.

4.1.8 Site Cleanup

Equipment no longer required in the EZ will be decontaminated and moved to the SZ. After all contaminated materials are containerized, the remaining equipment will be decontaminated and moved to the SZ. The decontamination equipment will then be cleaned and the work zone barriers removed. All decontamination fluids will be collected, sampled, and disposed of either at the sewage treatment plant or at an off-site TSD facility.

4.1.9 Backfilling and Site Restoration

The extent of any excavation and the points at which confirmation samples were taken will be surveyed to determine the volume of the excavation and to record the extent of the excavation and location of the samples. The excavation will then be backfilled to grade with clean material. Backfill must be clean, noncontaminated fill from an on-site or off-site borrow source. The backfill will be placed in 12-inch lifts and compacted to the required density. All areas will be covered with 3 inches of topsoil (defined as having a minimum of 5 percent organic matter), seeded with native grasses, and fertilized.

Erosion control measures shall be maintained until the growth of grasses is sufficient to prevent erosion. The sumps will not be backfilled.

4.2 SWMU #24/00 SLUDGE DRYING BEDS A & B

4.2.1 Work Scope

The scope of work includes excavating, sampling, transporting, and disposing of sludge and backfilling and restoring all disturbed areas. Figures 1-4 and 1-5 show the general location of the sludge beds and access.

4.2.2 Site Assessment

The NSWCR Crane Site Representative will determine if a UXO survey is necessary. If the potential exists for encountering explosive ordnance in the work area, NSWCR Crane will perform a surface UXO survey to identify and remove any unexploded ordnance. The area will be surveyed and located in relationship to existing monuments. Data will be collected to create a topographical map of the site and to verify the quantities of material to be excavated. Permits will be obtained for all site activities and mobilization will begin. Sampling of Beds A & B will be performed prior to full site mobilization to determine contamination levels and any hazardous materials from industrial wastes. Sampling will be as specified in Section 4.2.6 below. Preliminary information indicates that approximately 1,500 cubic yards of sludge may have to be removed (Wilson 1994).

4.2.3 Mobilization

The initial steps in mobilization will be to prepare the Environmental Condition Report and for the subcontractor to define the configuration of the work area including the boundaries of the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ) with appropriate decontamination stations, the Support Zone (SZ), and access routes. The work zones and access routes will be established. Tools, equipment, and supplies will be delivered to the site and personnel mobilized.

The subcontractor will steam clean and inspect all equipment before shipment to the site. Upon arrival at the site, the contractor will inspect the equipment for the presence of dirt, oils, and grease. The general condition of the equipment will be inspected and tested to ensure that all safety systems and alarms are functional. The performance of the equipment will be tested to determine if the equipment can perform the required tasks.

Storm water and erosion control measures shall be implemented as necessary to control storm water runoff and to prevent erosion. These measures are explained further in the Environmental Protection Plan.

4.2.4 Removal of Sludge and Filter Materials

Based on the results of the investigative samples (Section 4.2.2), the sludge will be dispositioned as contaminated or noncontaminated. Noncontaminated sludge shall be removed and disposed of as nonhazardous waste or used as fill. Contaminated sludge shall be removed, containerized in roll-offs, and characterized for disposal. Sludges with contaminants in excess of those levels in Table 5 and 6 of the SAP shall be transported to an off-site disposal facility or disposed of in the NSWC Crane landfill, if the acceptance criteria are met. Hazardous materials will be identified, packaged, labeled, and transported in accordance with the Waste Management Plan.

Confirmation sampling will be performed to determine whether the excavated area is below the contaminant levels listed in Tables 5 and 6 of the SAP. Sampling and analysis requirements are described in Section 4.2.6 below.

4.2.5 Cleaning of Concrete

If the initial characterization sampling indicates contaminant levels of Appendix IX compound above that listed in Tables 5 and 6 SAP, a high-pressure wash will be used to clean residue from the concrete walls of the Drying Beds. The beds will be considered clean when no visible residues are present on the walls. The walls will be cleaned sequentially from the top to the bottom of the wall. Contaminated wash water from the sludge bed wall cleaning process will be collected and characterized for disposal.

4.2.6 Soil Sampling and Analysis

Initial characterization sampling and analysis will be performed on the sludge drying beds to determine constituent contaminant levels present prior to excavation. During the initial characterization, sludge samples will be analyzed for Appendix IX compounds listed in Tables 5 and 6 of the SAP. Initial characterization samples will be taken at three points along the longitudinal centerline of each drying bed at depths of 6 and 18 inches.

After the sludge has been excavated, the filter bed of the sludge drying beds will be sampled to confirm that the soils remaining contain no Appendix IX compounds above the cleanup levels listed in Tables 5 and 6 of the SAP. Soil confirmation sampling will occur in a grid pattern to ensure the samples obtained are representative of the excavated area. To ensure that the entire area is included in the sampling grid, a maximum grid interval of 5 feet will be used to grid Sludge Bed A and Sludge Bed B. The number of samples collected is the cube root of the number of grid intersections. Sludge Bed A has 32 grid intersections; Sludge Bed B has 24 grid intersections. The cube root of 32 is 3.2, or 4 samples for Sludge Bed A. The cube root of 24 is 2.9, or 3 samples for Sludge Bed B. Each intersection of the grid will be sampled at depths of 6 to 18 inches. Samples will be submitted to the laboratory for analysis. Procedures to collect soil samples are discussed in the SAP.

4.2.7 Hazardous Waste Packaging, Transportation and Disposal

Contaminated materials classified as RCRA hazardous will be packaged, labeled, and placed in temporary storage for no longer than 90 days from the date of being excavated or generated. A licensed hazardous waste transporter will be contracted to ship the materials to a Treatment, Storage, and Disposal (TSD) Facility permitted for the type of material as determined by the analytical results of the sampling. Manifests shall be prepared and presented to the NSWC Site Representative for signature. Hazardous wastes will be packaged, labeled, and transported in accordance with the Waste Management Plan.

4.2.8 Site Cleanup

Equipment no longer required in the EZ will be decontaminated and moved to the SZ. After all contaminated materials are containerized, the remaining equipment will be decontaminated and moved to the SZ. The decontamination equipment will then be cleaned and the work zone barriers removed. All decontamination fluids will be collected, sampled, and disposed of either at the sewage treatment plant or at an off-site TSD facility.

4.2.9 Backfilling and Site Restoration

The extent of any excavation and the points at which confirmation samples were taken will be surveyed to determine the volume of the excavation and to record the extent of the excavation and location of the samples.

Sludge Drying Bed A will be restored to an operating condition. Restoration will include replacement of drain pipe, gravel beds, geotextile fabric and filter sand. Restorations shall also include all areas outside the drying beds disturbed by construction activities.

Sludge Drying Bed B excavation will be backfilled to grade with clean material. Backfill must be clean, noncontaminated fill from an on-site or off-site borrow source. The backfill will be placed in 12-inch lifts and compacted to the required density. All areas will be covered with 3 inches of topsoil (defined as having a minimum of 5 percent organic matter), seeded with native grasses, and fertilized. Erosion control measures shall be maintained until the growth of grasses is sufficient to prevent erosion.

5.0 QUALITY CONTROL

As prime contractor, MK will implement and retain full authority of the Quality Control Plan (QCP) for this project. The QCP is bound under separate cover and is to be used in conjunction with this Work Plan. MK will manage all matters involving Quality Control performed in the execution of NAVFAC Delivery Orders. This approach provides the Navy with a quality management system having clear lines of authority and responsibility, and a consistent approach and application of quality requirements.

The QCP identifies quality testing and inspection requirements for the scope of work to be performed. To supplement the information contained therein, Appendix A of this Work Plan provides Field Inspection Checklists for general and specific items when performing inspections.

6.0 SAFETY AND HEALTH

The Task-Specific Site Safety and Health Plan (SSHP) for this Work Plan is specific to interim measures cleanup activities for SWMUs #16/16 and #24/99. The SSHP is a supplement to this Work Plan. All details in the SSHP are to be strictly followed during the execution of the work.

7.0 DECONTAMINATION ACTIVITIES

7.1 MINIMIZATION OF CONTAMINATION

During site activities, all personnel shall minimize contact with contaminated materials to keep "clean" during site activities. All personnel should minimize kneeling, splashing, and inadvertent physical contact with contaminated materials. Field procedures will be developed to control overspray and runoff and to ensure that unprotected personnel working nearby are not affected.

Entrance to the exclusion zones will be limited to personnel trained in accordance with 29 CFR Part 1910.120. The level of protection worn within each exclusion zone will be specified by the Site Safety and Health Officer (SSHO). Selection of personal protective equipment and anticipated levels of protection are summarized in Tables 5 and 6 of the SSHP. All personnel leaving the exclusion zone will pass through a decontamination zone and follow personnel decontamination procedures as specified in the SSHP.

7.2 DECONTAMINATION FACILITIES

Because of the distances between the different work areas, each SWMU shall have a designated decontamination facility. Before construction of each decontamination facility, soil samples shall be taken at the proposed location of the decontamination pad to establish the environmental conditions before interim measures cleanup activities begin.

Temporary personnel decontamination and shower/changeroom trailers will be provided in those areas designated by the SSHO. Each equipment decontamination facility shall be constructed of a high-density polyethylene (HDPE) liner draped over sandbags and sloped to a sump or equal containment system. The liner will be visually inspected before use on a daily basis to detect possible failures of the liner material. The inspection process will consist of checking for the following:

- Evidence of tears and holes.
- Evidence of seepage.
- The sheeting is adequately fastened to the side walls.
- The liner adequately covers the sandbags at the end section.

If the liner is damaged, it will be repaired or replaced before further use of the facility. Soil beneath the liner in the area of the breach will be sampled.

Records will be maintained specifying facility construction material and methods, disposition of liquids and solids, daily inspections, and any repairs and/or breaches of liner integrity.

All decontamination fluids collected in the sump will be containerized at the end of each shift and sampled to determine disposal requirements. If precipitation is predicted, the decontamination pad will be covered to prevent accumulation of storm water.

After interim measures cleanup of a specific SWMU is completed, the decontamination facility will be dismantled. The materials from the facility are anticipated to be reused at another SWMU. If there is no indication of seepage, tears or holes, the HDPE liner will be thoroughly cleaned before being transported to another SWMU. Any decontamination facility materials that have been dispositioned as waste and are not reusable will be characterized and properly disposed of.

After the decontamination facility has been dismantled and removed, the underlying surface will be visually inspected. Visibly contaminated material will be removed and managed as a potentially hazardous material.

7.3 PERSONNEL DECONTAMINATION

Personnel will be required to pass through a decontamination area before exiting the exclusion zone. The personnel decontamination area will be located adjacent to the exclusion zone. The area will include, as required, a protective clothing removal area and container, respirator removal area and containers, storage for clean personnel protection equipment and clothing, wash station supplies for hands and face, and emergency showers for whole-body cleaning.

Before changing into street clothes, whole-body cleaning will be mandatory for personnel exiting areas as designated in the SSHP. The whole-body shower and change trailer will be provided in a central location.

All contaminated personal protective equipment and clothing shall be properly disposed of or cleaned and inspected for reuse. Field personnel decontamination procedures will be generated for these actions and will be monitored by the SSHO.

7.4 DECONTAMINATION OF HEAVY EQUIPMENT

Portions of construction and field equipment that have come into contact with any potentially contaminated material will be decontaminated. Heavy equipment, such as trucks and backhoes, will be cleaned by high-pressure water or steam. The equipment will be visually inspected for signs of contamination. If signs of contamination are still present, the cleaning procedures will be repeated until the criteria for cleanliness has been met. A detailed written field procedure will be prepared for this action.

7.5 DECONTAMINATION OF SAMPLING EQUIPMENT

Sampling equipment will be decontaminated per the manufacturer's instructions or as described in the Sampling and Analysis Plan.

8.0 WASTE MANAGEMENT

Waste management, including disposal functions, will be conducted in accordance with the project's Waste Management Plan (WMP) and all applicable regulations as specified in this Work Plan. The WMP is bound under separate cover and is to be used in conjunction with this Work Plan. However, NSWCR Crane retains ownership of all wastes generated and is responsible for signing all waste manifests prepared for this project.

During field activities, various wastes will be generated including contaminated and noncontaminated debris and incidentally removed soil, ground and rain water, decontamination water, disposable personnel protective equipment, and inert wastes.

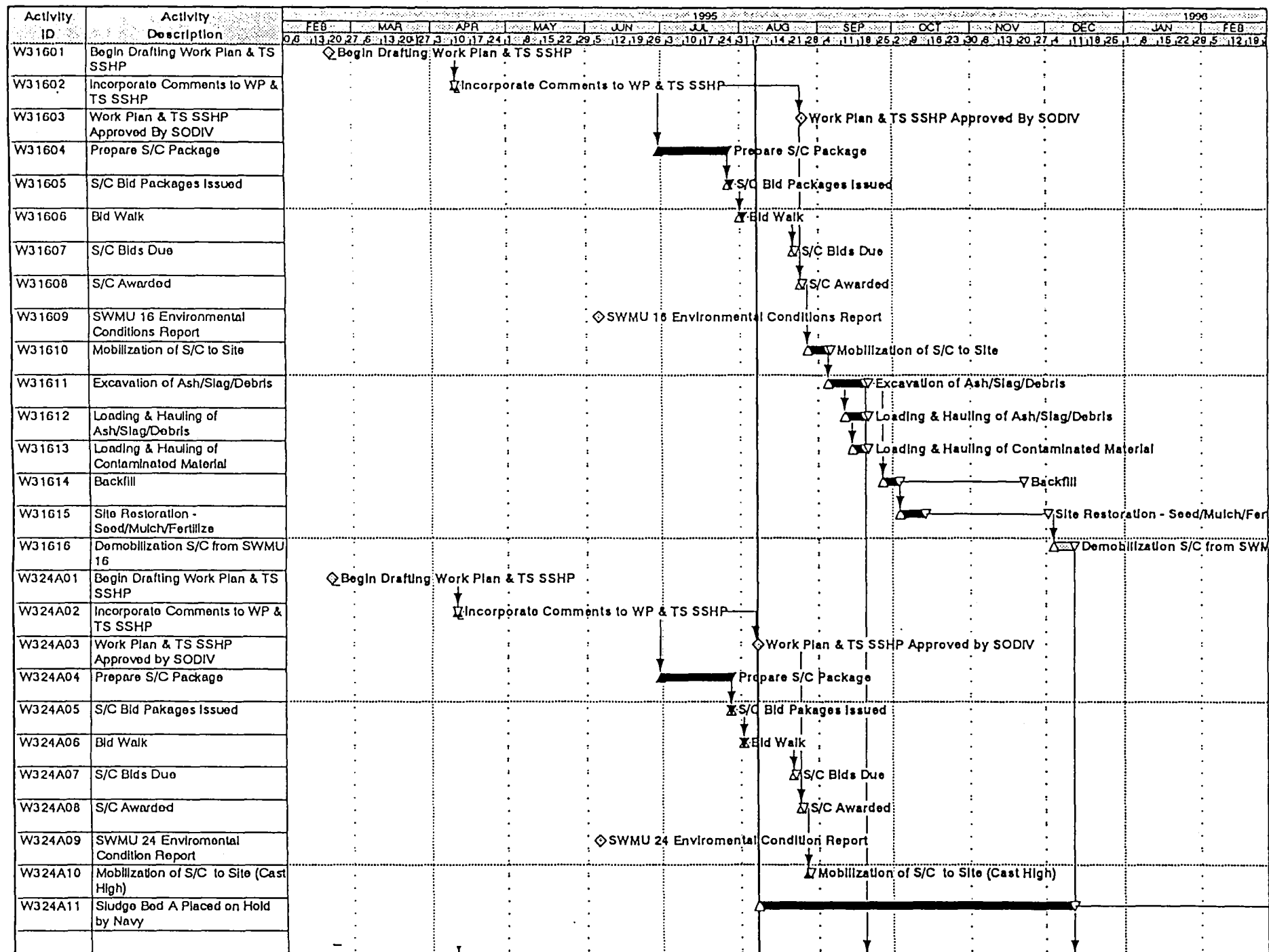
Initially, wastes will be placed in stockpiles and sampled for contamination. Contaminated materials will be containerized and characterized before off-site disposal. Characterization is necessary for material excavated from the SWMUs. All contaminated material will be containerized in 20- or 40-cubic yard roll-offs or other approved containers. Once a roll-off is filled, four discrete samples will be obtained from each quadrant of the roll-off. The quadrants will be determined by visual estimation in the field.

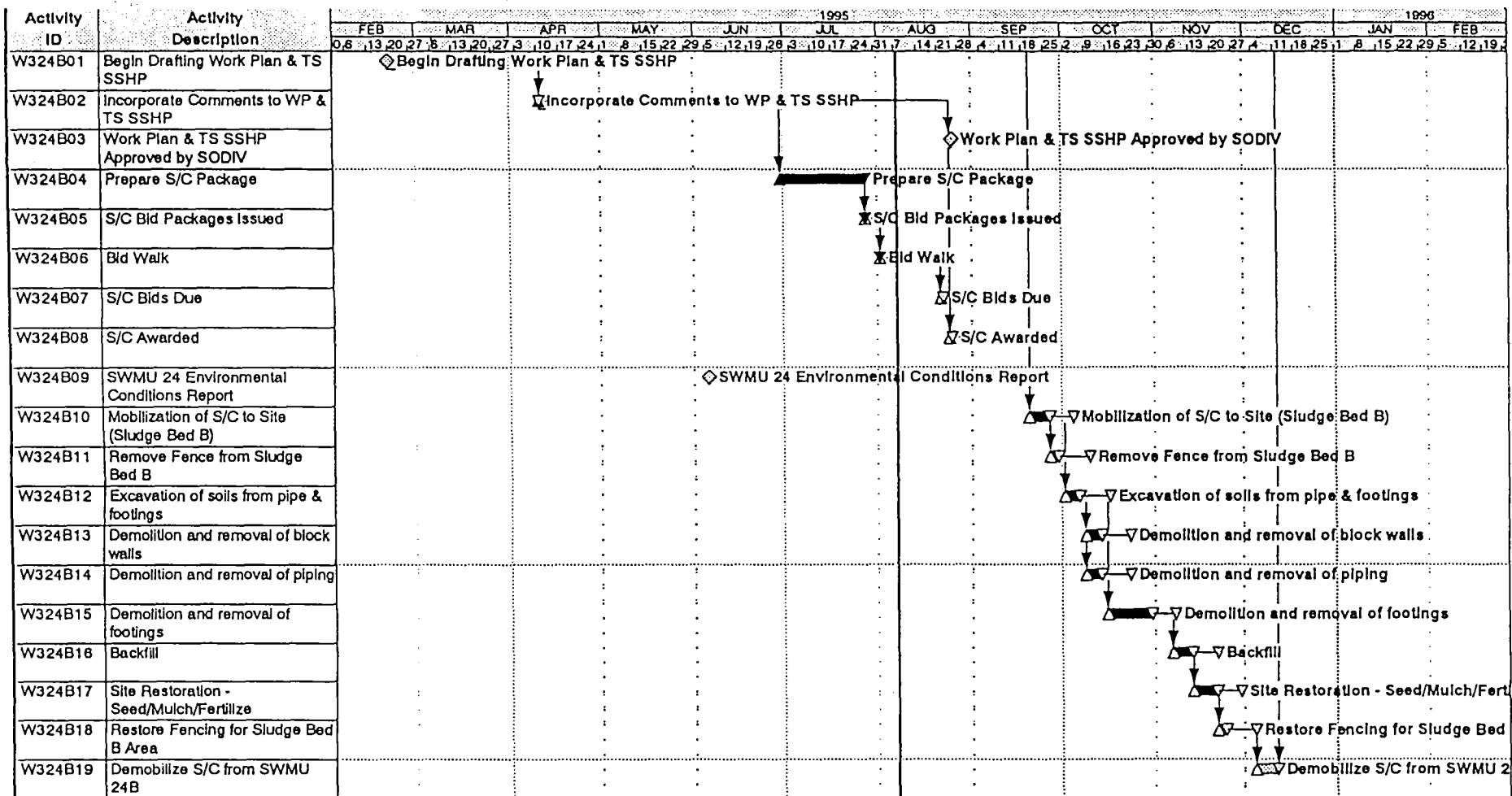
Each sample will be collected from at least 1 foot deep. The four samples collected will be composited according to weight (i.e., an equal weight from each discrete sample is combined into the composite sample). Soil samples will be collected using the procedures contained in the Sampling and Analysis Plan (SAP). The SAP is bound under separate cover and is to be used in conjunction with this Work Plan. Each composite sample will be analyzed for the parameters found in Table 1 of the SAP. Laboratory results of the characterization analysis will be used to classify the materials per the WMP.

9.0 ENVIRONMENTAL PROTECTION

During site work, MK will employ measures to ensure protection of the environment. All site work will be performed in a manner that will minimize pollution of the air, water, and land. Environmental protection activities executed at the site will follow the Environmental Protection Plan (EPP) and all applicable regulatory requirements. The EPP is bound under separate cover and is to be used in conjunction with this Work Plan. Care will be exercised to minimize the areas to be disturbed. An Environmental Condition Report (ECR) will be prepared before interim measures cleanup activities at the site.

10.0 SCHEDULE



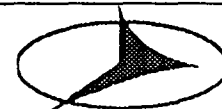


Project Start: 27 JAN 95
 Project Finish: 11 DEC 95
 Date Data: 08 AUG 95
 Plot Date: 24 AUG 95

WPS3

Morrison Knudsen Corporation
 NAVAL SURFACE WARFARE CENTER-CRANE
 Classic Schedule Layout

Sheet 2 of 2



11.0 REFERENCES

- Halliburton NUS Environmental Corp. 1992. *RCRA Facility Investigation Phase I Environmental Monitoring Reports; Solid Waste Management Units #15/06, #14/00 and #16/16, Naval Surface Warfare Center, Crane Division, Crane, Indiana.* November.
- Morrison Knudsen Corporation (MK), 1994. Site Meeting Minutes of August 16-17. August.
- A.I. Wilson, 1994. Fax, Wilson to Centinaro; Volume of Sludge Drying Beds. August 23.

APPENDIX A INSPECTION ITEMS

MORRISON KNUDSEN CORPORATION Engineering, Construction, & Environmental			Procedure Type FIELD INSPECTION CHECKLIST		
Checklist Title WASTE STORAGE AREA INSPECTION			Inspection Code	Revision Date JAN 95	Checklist Page 1 of 1
ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE	
1	Are all containers labeled?				
2	Are any containers bulging or leaking?				
3	Have containers/stockpiles been placed on an impervious pad or area?				
4	Have all containers/stockpiles been sampled?				
5	Are all stockpiles covered?				
6	Are run-on/run-off measures in place?				
7	Are fluids from the waste storage area being disposed of properly?				
8	Is any waste nearing 90 days of storage in the Waste Storage Area?				
9					
10					
REMARKS:					
Specific Item Identification or Location, as applicable:					

MK Project Number MORRISON KNUDSEN CORPORATION NSWC Crane Delivery Order 0009 Engineering, Construction, & Environmental	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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	Procedure Type FIELD INSPECTION CHECKLIST
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Checklist Title DECONTAMINATION FACILITY INSPECTION	Inspection Code	Revision Date JAN 95	Checklist Page 1 of 1
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ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE
1	Has a decontamination area been constructed in accordance with the work plan?			
2	Are fluids used for decontamination contained at the decontamination area?			
3	Are fluids disposed of properly on a regular basis?			
4	Are run-on/run-off measures in place?			
5	Have any leaks/seepage occurred since the last inspection?			
6	Is the containment system still in good repair (no holes, tears or cracks)?			
7	Is the decontamination area still in good repair?			
8				
9				
10				

REMARKS:

Specific Item Identification or Location, as applicable:

MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

MK Project Number

NSWC Crane-Delivery Order 0009

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

GENERAL ITEMS-PRIOR TO EXCAVATION

Inspection Code

Revision Date

JAN 95

Checklist

Page 1 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE
1	Has an Environmental Condition Report been prepared for the area?			
2	Has coordination been made with the area occupants?			
3	Has an unexploded ordnance survey been completed?			
4	Have the EZ, CRZ and SZ been defined and laid out?			
5	Have erosion control measures been put in place?			
6	Has the contractor hired to accomplish the work submitted all required reps/certs, training records and insurance certificates?			
7	Have investigative soil samples been taken to define the levels of contamination in the area?			
8	Have Photographs been taken of the site?			
9	Is contractor equipment in working order and has it been cleaned?			
10	Has a decontamination area been constructed?			
11	Have necessary permits been obtained and have required notifications been made?			

REMARKS:

Specific Item Identification or Location, as applicable:

MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

MK Project Number

Drawing Number

Work Package Number

Inspection Report

NSWC Crane-Delivery Order 0009

Sheet _____ of _____

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

GENERAL ITEMS-DURING EXCAVATION

Inspection Code

Revision Date

JAN 95

Checklist

Page 2 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE
1	Have arrangements been made to dry out the sludge pile after excavation?			
2	Is storm water or groundwater properly disposed of?			
3	Has soil sampling been accomplished in the excavation and stockpile?			
4	Do the analytical results confirm that the excavation is clean?			
5	Has contaminated sludge been properly containerized, labeled and manifested?			
6	Has contaminated soil been properly containerized, labeled and manifested?			
7	Have photographs been taken of the remediation activities?			
8	Were daily logs and reports made?			
9	Has the decontamination facility been inspected on a daily basis?			
10	Has all equipment been decontaminated?			

REMARKS:

Specific Item Identification or Location, as applicable:

MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

MK Project Number

NSWC Crane-Delivery Order 0009

Drawing Number

Work Package Number

Inspection Report

Sheet _____ of _____

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

GENERAL ITEMS-AFTER EXCAVATION

Inspection Code

Revision Date

JAN 95

Checklist

Page 3 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE
1	Has the excavation been backfilled with clean material which has been placed and compacted properly?			
2	Has topsoil been placed in disturbed areas (not including Drying Beds or sumps)?			
3	Have the disturbed areas been seeded?			
4	Has a general cleanup been done of the affected areas?			
5	Were photographs taken of the affected areas?			
6	Were soil erosion prevention measures left in place until vegetation grew?			
7				
8				
9				
10				

REMARKS:

Specific Item Identification or Location, as applicable:

MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

MK Project Number

Drawing Number

Work Package Number

Inspection Report

NSWC Crane-Delivery Order 0009

Sheet _____ of _____

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

**SOILS
BACKFILL AND COMPACTION**

Inspection Code

Revision Date

Checklist

SWMU #16/16 - Cast High Explosive/Incinerator Building 146

SO-06

DEC 94

Page 1 of 2

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/ DATE
1	Confirm a soils report has been generated to confirm soils types and depth of water	N/A		
2	Confirm work areas have been located with the limits of work clearly established			
3	Identify existing improvements and items that are to remain and verify arrangements to protect these items from damage (such as trees, utility poles, buildings, fences and piping, etc.)			
4	Verify precautions are taken to prevent/contain the spillage of gas, oil, slurry, etc. to assure compliance with the base spill plan.			
5	Verify that shoring has been approved, as required, and that provisions have been made for safety barricades.			
6	Verify that excavation is performed in accordance with the Work Plan and within established bounds.			
7	Verify that sub-standard materials (tree roots, etc.) are removed.			
8	Verify that subsoil irregularities such as soft spots are removed.			
9	Confirm that drainage, de-watering, etc., conforms with design/specs.			
10	Ensure that materials, compaction, and work are performed, inspected, and tested in accordance with the Work Plan, procedures, standards, and specifications. Required reports shall be maintained.			

REMARKS:

Specific Item Identification or Location, as applicable:			
MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____

MORRISON KNUDSEN CORPORATION Engineering, Construction, & Environmental			Procedure Type FIELD INSPECTION CHECKLIST	
Checklist Title SOILS BACKFILL AND COMPACTION SWMU #16/16 - Cast High Explosive/Incinerator Building 146			Inspection Code SO-06	Revision Date DEC 94
			Checklist Page 2 of 2	

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/DATE
11	After an area has been excavated, confirm the area was resurveyed so foundations are properly located.	N/A		
12	Confirm footing areas are compacted.	N/A		
13	Check foundation excavations for adequacy, bracing, form clearance, etc.	N/A		
14	Confirm that footing drains are installed in manner specified.	N/A		
15	Check that backfill materials comply with specifications (moisture, density, gradation).			
16	Verify performance of ASTM D 4254/ASTM D 4253 (<i>Minimum Index Density of Soils and Calculation of Relative Density and Test Method for Maximum Index Density of Soils Using a Vibratory Table</i> , respectively) by the testing laboratory for each soil type.			
17	Verify that backfill materials are compacted in lift thicknesses that do not exceed specification. Compaction testing of lifts shall also be confirmed.			
18	Verify performance of ASTM D 3017 and ASTM D 2922 (<i>Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) and Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)</i> , respectively) by the Testing Laboratory and documentation of results.			
19	See that corrective action measures have been performed where required, verified, and documented.			

PROVIDE DETAILED SKETCH:

Specific Item Identification or Location, as applicable:

MK Project Number NSWCR Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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MORRISON KNUDSEN CORPORATION Engineering, Construction, & Environmental			Procedure Type FIELD INSPECTION CHECKLIST	
Checklist Title SOILS BACKFILL AND COMPACTION SWMU #24/00 - Sludge Drying Beds			Inspection Code SO-09	Revision Date DEC 94
			Checklist Page 1 of 2	

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/DATE
1	Confirm a soils report has been generated to confirm soils types and depth of water table.	N/A		
2	Confirm work areas have been located with the limits of work clearly established (stakes, lines, monuments).			
3	Identify existing improvements and items that are to remain and verify arrangements to protect these items from damage (such as trees, utility poles, buildings, fences and piping, etc.)			
4	Verify precautions are taken to prevent/contain the spillage of gas, oil, slurry, etc. to assure compliance with the base spill plan.			
5	Verify that shoring has been approved, as required, and that provisions have been made for safety barricades.			
6	Verify that excavation is performed in accordance with the Work Plan and within established bounds.			
7	Verify that sub-standard materials (tree roots, etc.) are removed.			
8	Verify that subsoil irregularities such as soft spots are removed.			
9	Confirm that drainage, de-watering, etc., conforms with design/specs.			
10	Ensure that materials, compaction, and work are performed, inspected, and tested in accordance with the Work Plan, procedures, standards, and specifications. Required reports shall be maintained.			

Specific Item Identification or Location, as applicable:

MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
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MORRISON KNUDSEN CORPORATION Engineering, Construction, & Environmental			Procedure Type FIELD INSPECTION CHECKLIST		
Checklist Title <div style="text-align: center;"> SOILS BACKFILL AND COMPACTION SWMU #24/00 - Sludge Drying Beds </div>			Inspection Code <div style="text-align: center;">SO-09</div>	Revision Date <div style="text-align: center;">DEC 94</div>	Checklist <div style="text-align: center;">Page 2 of 2</div>
ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY/DATE	
11	After an area has been excavated, confirm the area was resurveyed so foundations are properly located.	N/A			
12	Confirm footing areas are compacted.	N/A			
13	Check foundation excavations for adequacy, bracing, form clearance, etc.	N/A			
14	Confirm that footing drains are installed in manner specified.	N/A			
15	Check that backfill materials comply with specifications (moisture, density, gradation).				
16	Verify performance of ASTM D 4254/ASTM D 4253 (<i>Minimum Index Density of Soils and Calculation of Relative Density and Test Method for Maximum Index Density of Soils Using a Vibratory Table</i> , respectively) by the testing laboratory for each soil type.				
17	Verify that backfill materials are compacted in lift thicknesses that do not exceed specification. Compaction testing of lifts shall also be confirmed.				
18	Verify performance of ASTM D 3017 and ASTM D 2922 (<i>Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth) and Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)</i> , respectively) by the Testing Laboratory and documentation of results.				
19	See that corrective action measures have been performed where required, verified, and documented.				
PROVIDE DETAILED SKETCH:					
Specific Item Identification or Location, as applicable:					
MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____		

TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN

SUPPLEMENT TO WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS #16/16 and #24/00

**NSWC CRANE
Crane, Indiana**

CONTRACT #N62467-93-D-1106
DELIVERY ORDER 0009
STATEMENT OF WORK 007

August 18, 1995
Revision B

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1.0 INTRODUCTION

This Task-Specific Site Safety and Health Plan (SSHP) describes safety and health requirements for interim cleanup measures at NSWC Crane, specifically for Solid Waste Management Units (SWMUs) #16/16 and #24/00. This SSHP is consistent with requirements of the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Site Regulations; 29 CFR 1910.120 and 29 CFR 1926.65; and the U.S. Army Corps of Engineers (ACOE) *Safety and Health Requirements Manual* EM 385-1-1, dated October 1992.

This SSHP is applicable to all personnel who enter work areas described in this SSHP and who are under the control of Morrison Knudsen Corporation (MK) or MK's subcontractors.

1.1 WORK TASK SUMMARY

The MK *Site Meeting Minutes* (MK 1994c) and the *RFI Phase II Soils Report for Rockeye, SWMU 10/15* (ACOE 1992a) were reviewed extensively in preparation of this SSHP. Work tasks are briefly summarized as follows:

SWMU #16/16, Cast High Explosive/Incineration Building. Excavating, sampling, and disposing of sludge; containerizing, sampling, and disposing of contaminated soils; cleaning of two sumps; and backfilling and restoring the excavated area.

SWMU #24/00. Excavating, sampling, transporting, and disposing of sludge; and backfilling and restoring all disturbed areas.

Table 1 lists the various sites and summarizes the scope of work and potential contaminants.

Detailed task descriptions are provided in Section 4.0 of the Work Plan.

1.2 CONTAMINANT CHARACTERISTICS

The potential contaminants from each SWMU are summarized below. Additional information concerning the potential contaminants can be found in Table 2. Material Safety Data Sheets (MSDSs) or National Institute for Occupational Safety and Health (NIOSH) Pocket Guides will be used as a source of information to help personnel recognize and control occupational chemical hazards. MSDS and NIOSH information for each of the potential contaminants, process chemicals, or other chemical substances encountered during the interim cleanup process will be organized into a separate binder, commonly called the "MSDS Binder." These binders will be available to all personnel, at anytime, and

will be at appropriate on-site locations such as the MK job-site trailer, NSWC Medical Building, and each active SWMU work area.

SWMU #16/16, Cast High Explosive/Incineration Building. The primary gravel and soil contaminants from Building 146 loading and washout activities were TNT, RDX, HMX, Composition A and Composition B, and ammonium picrate. Incinerator ash was stockpiled over the gravel and soil and is believed to contain heavy metals including arsenic, lead, barium, cadmium, chromium, and mercury (probably some type of mercury salt) and PCB oxidation products. Approximately 2,500 yards of surface gravel may contain shell casings, bullets, and metallic slag.

SWMU #24/00. The sludge beds are believed to contain industrial wastewater sludges contaminated with metals and possibly herbicides and pesticides.

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2.0 SAFETY AND HEALTH HAZARDS SUMMARY

This section describes the potential safety and health hazards anticipated for SWMUs #16/16 and #24/00.

2.1 OVERVIEW

The potential risk of acute exposure to the chemical contaminants listed in Table 2 is considered low if the engineering controls, administrative controls, and Personal Protective Equipment (PPE) requirements are strictly adhered to. The highest risk chemical contaminants are TNT and RDX. Controls in place for explosives will also meet or exceed the controls necessary for protection from the heavy metals.

Other hazards at this project site are construction safety hazards associated with heavy equipment; confined space entry involving cleaning at both SWMU's; soil excavation and penetrations with potential contact with underground utilities and process piping; walking and working surfaces; traffic control and haul road layout; and eye/head/feet physical hazards. Other concerns include energy control (electrical and other kinetic energy sources) and contact with overhead electrical lines or other utility lines. Heat stress and cold stress may also be a concern.

2.2 ACTIVITY HAZARD ANALYSES

Activity hazard analyses have been prepared for each anticipated task according to EM 385-1-1 (ACOE 1992). These hazard analyses are in Appendix A. Site activity will be reviewed by the attending superintendent prior to the start of work to determine if the prepared activity hazard analysis adequately addresses the planned work task. If the activity hazard analysis is inadequate, further analysis will be performed, and a revised activity hazard analysis will be prepared. Site workers will receive a pre-entry briefing.

2.3 CHEMICAL HAZARDS

The potential chemical contaminants, their exposure limits, sign and symptoms of overexposure, and first aid requirements are presented in Table 2.

2.4 CONSTRUCTION SAFETY HAZARDS

2.4.1 Physical Hazards

The physical hazards associated with the project include the use of heavy equipment such as dump trucks, backhoes, excavators, cutting saws for

clearing and grubbing, high voltage electrical lines, heat stress (depending on season) and other adverse weather conditions, and noise. These hazards could cause slips, trips, and falls, cuts, contusions, and lacerations, traffic accidents, electrical shock, fires and explosions, crunching, pinching, injury from falling objects, and heat-related disorders.

2.4.2 Noise

Certain operations may generate noise levels that exceed applicable limits. Hearing protection is required when noise levels exceed 85 dBA steady state or 140 dBA impulse, regardless of the exposure duration. Hearing protection will be provided to all field personnel. A comprehensive Hearing Conservation Program will be implemented when noise levels equal or exceed 85 dBA on an 8-hour time weighted average.

2.4.3 Adverse Weather Stress

All employees are to be alert to the signs and symptoms of heat stress. Should any of the following symptoms occur—extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, pale clammy skin—the employee is to immediately leave the work area, rest, cool off, and drink plenty of cool water. If the symptoms do not subside after a reasonable rest period, the employee shall notify his or her supervisor and the Site Safety and Health Officer (SSHO) to seek medical assistance. The SSHO will observe for the signs of heat stress in site personnel and increase the frequency of breaks and fluid consumption as necessary. Refer to Section 7.2.6 for additional guidance on heat and cold stress management.

2.4.4 Excavations

Open excavations, by their nature, are hazards. Accidental falls into the excavation or side wall collapse while personnel and equipment are near the excavation are potential hazards. Refer to MK project procedure PHSP 005.1 for specific excavation requirements.

An Excavation and Trenching Permit system shall be used whenever excavation, trenching, or penetrations are planned. Figure 1 depicts the MK Excavation and Trenching Permit.

2.4.5 Overhead Power Lines

Overhead high voltage power lines represent an electrocution hazard. Work conducted in proximity of overhead power lines will be performed in accordance with the requirements in EM 385-1-1, Section 11.E.

2.4.6 Underground Utilities

Underground utilities pose hazards such as fire and/or explosion from gaslines, electrocution from power lines, and excavation collapsing and/or filling from water lines. Positive identification of underground utilities and services is required. Underground utilities will be located in accordance with MK procedure PHSP 005.1. If hazardous energy control is anticipated for underground utilities, the requirements of MK procedure PHSP 001.1 shall be followed.

2.4.7 Fire and Explosion

An Unexploded Ordnance Survey (UXO) will be required prior to mobilization and throughout the entire excavation process. The UXO Survey is completed and staffed by NSWC personnel.

No hot work or open flames will be allowed in the work area without a Hot Work Permit. The MK Hot Work Permit is depicted in Figure 2. Hot Work Permitting will be coordinated through the base Fire Department. If fire or explosion hazards exist, all tools will be of the non-sparking type. Electrical pumps and blowers will be bonded or grounded to reduce hazards associated with static discharge. Portable power tools shall be explosion proof in accordance with the National Fire Protection Association (NFPA) 70B and 70E, Class 1, Division 1, Group D or unless approved otherwise.

Fire fighting equipment shall include at least one 40-lb or equivalent "ABC" multi-purpose fire extinguisher maintained at the entrance to the Contamination Reduction Zone (CRZ). All heavy equipment will be fitted with a minimum 10-lb "ABC" fire extinguisher. Job-site trailers and temporary structures will have fire extinguishers installed in accordance with NFPA 10.

2.4.8 Hazardous Energy Control (Lockout/Tagout)

Any system with the potential for unexpected energizing, start-up, or release of potential or kinetic energy during the servicing and maintenance of the system shall be isolated in accordance with MK procedure PHSP 001.1. Intake piping for the sludge beds and sumps will require blanking-off. The Superintendent is responsible for energy control. The on-site Public Works Department (PWD) will provide energy control services. MK will coordinate these services.

2.4.9 General Safety Hazards

Other potential safety hazards include slipping, falling, head trauma, back strains from lifting heavy objects, insect and snake bites, and similar hazards. All project personnel will wear appropriate PPE for the required work activity. As a minimum, Level D protection (hard hats, steel-toed boots and eye protection) will be required in all work areas. First-aid facilities will be available

on-site for minor injuries. Local emergency response organizations will be notified of work activities to deal with emergencies.

2.4.10 Vehicular Traffic and Work-Site Control Hazards

Potential hazards from vehicular traffic around work areas will be controlled by using traffic control items such as traffic cones, flagging, barricades, and signage. Types and placement of traffic control items will be in accordance with EM 385-1-1, Section 8 and 29 CFR 1926.201 and 202.

2.4.11 Clearing and Grubbing

Clearing and grubbing of work sites will be completed in accordance with EM 385-1-1 Section 31.

2.4.12 Access and Haul Roads

If special access and haul roads are required and constructed for this project, they will be constructed in accordance with EM 385-1-1 Section 21.I.

3.0 RESPONSIBILITIES AND AUTHORITIES SUMMARY

This section describes the safety and health responsibilities of project personnel. Ultimately, the responsibility for the safety and health lies with the individual. All personnel must be aware of project hazards and the methods of reducing the risk of injury and illness. All personnel will comply with the rules and procedures set forth in this plan and will make project management aware of any conditions that may jeopardize the welfare of project workers and/or the public. Names and telephone numbers of responsible persons are listed in Table 3.

3.1 MK PROJECT MANAGER (PM)

The PM is responsible for the management of all aspects of the project, including safety and health. The PM is responsible for ensuring that all project tasks receive appropriate safety and health review before commencement of field activities and that the necessary equipment and facilities are available to implement the SSHP.

3.2 MK GENERAL SUPERINTENDENT AND SUBCONTRACTOR JOB SUPERVISORS

The MK General Superintendent and the Subcontractor Job Supervisor(s) are responsible for ensuring that the safety and health aspects for their particular task are addressed. They are responsible for the implementation of the SSHP in the field and for ensuring that all project personnel comply with provisions of the plan. The MK General Superintendent and Subcontractor Job Supervisor(s) are also responsible for notifying the MK Site Safety and Health Officer (SSHO) of any changes in work conditions which may affect the safety and health aspects of the task. The MK General Superintendent is responsible for conducting Plan of the Day (POD) meetings. The Subcontractor Job Supervisor(s) are responsible for conducting Pre-Entry Briefings and Post Entry Briefings.

The Subcontractor Job Supervisor(s) must notify the MK SSHO and MK General Superintendent of all accidents and incidents as soon as possible. The Subcontractor Job Supervisor(s) shall conduct an accident investigation and record the results of the investigation on a Supervisor Accident Investigation Report form or equivalent form. The initial investigation report shall be formally transmitted to the MK Project Manager within four hours after critical management of the incident is complete. The MK Project Manager shall follow the reporting requirements described in Section 11.3 of this SSHP. Section 11.3 references the MK Project Procedure PHSP-0004-1. The MK General Superintendent shall conduct a critique of the incident with selected MK and Subcontractor personnel as soon as possible after critical management of the

incident is complete. Lessons learned will then be developed by the MK General Superintendent and Subcontractor Job Supervisor(s) and communicated to all affected personnel.

3.3 MK CERTIFIED INDUSTRIAL HYGIENIST (CIH)

The MK CIH who is the MK Project Management Office (PMO) Health and Safety Manager is responsible for preparation of the Site Safety and Health Plan (SSHP). The CIH is based out of the Boise, ID office. The CIH is responsible for making modifications to the plans and recommending changes to the work tasks if they affect safety and health. The CIH is responsible for ensuring that all required sampling/monitoring is performed and that all required safety and health documentation is maintained. The CIH may assign some tasks to the MK SSHO for implementation.

3.4 MK SITE SAFETY AND HEALTH OFFICER (SSHO)

The MK SSHO is responsible for the day-to-day implementation of the Site Safety and Health Plan (SSHP), and verification of compliance with the SSHP and all applicable occupational safety and health rules and regulations. The MK SSHO has the authority to suspend work at any time if there is an imminent threat to the health and safety of project workers or the general public. The MK SSHO shall assure the Navy's designated authority at the site is notified immediately of any accident including spills. The MK SSHO shall assist in the accident investigation effort and shall have final approval authority for accident reports. The MK Work Plan document describes in detail the role and responsibilities of the MK SSHO on this project.

3.5 SUBCONTRACTOR DESIGNATED COMPETENT SAFETY PERSON

The primary Subcontractor shall designate a competent and qualified person, subject to the approval of the MK SSHO and the MK Site Project Engineer, responsible for the implementation of this SSHP and their Company's safety and health program. This designated person shall be referred to as the Subcontractor SSHO. The Subcontractor's SSHO shall be qualified to perform air monitoring to support the subcontractor's operation and be supplied with the appropriate monitoring equipment described in Section 7 of this plan. The Subcontractor SSHO shall provide the MK SSHO copies of all factory calibration certificates and the forms to be used to record daily field calibrations for each instrument. The Subcontractor SSHO shall provide a daily site safety report and shall coordinate his efforts with the MK SSHO.

3.6 SUBCONTRACTOR PERSONNEL

All subcontractors are required to have a qualified designated competent safety person who will assure and abide by the requirements of this SSHP as stated

above. They are also required to comply with all applicable and appropriate federal, state, and local laws, standards, and regulations. Subcontractors must notify the MK SSHO and MK General Superintendent of all accidents as soon as possible. Subcontractors must maintain records of all first aid rendered and recordable, and lost time injuries. Subcontractors must notify the MK SSHO of any changes in work conditions which may affect the safety and health aspects of the task.

3.7 NEAREST EMERGENCY MEDICAL FACILITY

Directions to the On-Site NSWC Medical Department:

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of road H-2, just north of H-5.

Directions to Bedford Medical Center:

From the Bloomington Gate, head east on Highway 58 to the city of Bedford, then turn left onto 16th Street. The distance to hospital is approximately 20 miles.

Directions to Bloomington Hospital:

Exit NSWC on road H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead over the bypass (Bloomfield Road), and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street, and the hospital will be on right-hand side of the road.

Note: Refer also to Table 3 and Figure 3.

4.0 TRAINING AND SAFETY MEETING REQUIREMENTS SUMMARY

This Section lists all regulatory driven and project specific training required for this job. Table 4 provides a summary on training requirements. Safety related meetings required for this project are described beginning in Section 4.10. A training and meeting requirements matrix is shown in Table 4.

4.1 HAZARDOUS WASTE OPERATIONS TRAINING

All personnel entering a contamination reduction zone or exclusion zone shall have completed the initial 40-Hour Hazardous Waste Operations Safety and Health Training and three days of supervised experience pursuant to 29 CFR 1910.120(e)(3). All personnel shall receive eight hours of refresher training annually, pursuant to 29 CFR 1910.120(e)(8), as necessary. All on-site supervisors and managers as well as subcontractor superintendents and foremen shall receive an additional eight hours of specialized training pursuant to 29 CFR 1910.120(e)(4).

4.2 SITE SPECIFIC TRAINING

All personnel shall receive site-specific training prior to entering the site or commencement of work. All site employees and subcontractors, including those working in the support zone, shall receive this training. The Subcontractor Job Supervisor(s) are responsible for identifying personnel requiring this training and coordinated with the MK SSHO regarding scheduling of this training. The MK SSHO or designated alternate will conduct the training. Site visitors shall receive site-specific training prior to entering an exclusion zone. An abbreviated version of this training will be given to site visitors not entering an exclusion zone but whose business will be conducted unescorted in the near vicinity of the Work Zones. The format and content will be left up to the discretion of the MK SSHO. This training will cover the SSHP, but not necessarily be limited to, the following topics.

- Names of site safety and health personnel.
- Safety and health hazards present on the site and anticipated during the work campaign.
- Hazard Communication.
- PPE requirements.
- Safe work practices including drum handling.
- Engineering controls.
- Medical surveillance requirements, including recognition or symptoms and signs which might indicate overexposure to hazards.
- Decontamination procedures.
- Emergency procedures.
- Spill containment plan.

- Confined Space Entry.
- Energy Control.
- Requirements of this SSHP.

4.3 CONFINED SPACE ENTRY TRAINING

When sludge beds, pits, sumps and excavations greater than 5 foot deep are to be entered, the entry shall be treated as a permit confined space until authorized to be downgraded to non permit confined space in accordance with MK Industrial Hygiene (IH) Procedure Number 9 and 29 CFR 1910.146. This is based on initial and periodic air monitoring to insure the breathing atmosphere is safe or can be maintained safe by ventilation equipment and engineering controls in place to safeguard the excavation from collapse. No free standing water must be present in the confined space and adequate means of ingress and egress must be present. Personnel involved with confined space entry work shall be required to have documented training in confined space entry procedures in accordance with the requirements of 29 CFR 1910.146. Confined space entry procedures shall be implemented in accordance with MK IH Procedure 9 and implemented in accordance with Procedure 9. An MK Confined Space Entry Permit shall be posted at each work site during confined space entry activities. The NSW Fire Department shall be notified of the location of confined space entries and expected duration at least two hours in advance.

4.4 RESPIRATORY PROTECTION TRAINING

All MK personnel and subcontractors required to use respiratory protection shall be trained in respirator use, care and maintenance pursuant to 29 CFR 1926.103 and 29 CFR 1910.134. Each individual shall be medically qualified to wear a respiratory device and have documented evidence of successfully completing respiratory training and fit testing.

4.5 HAZARD COMMUNICATION TRAINING

All personnel shall complete hazard communication training pursuant to 29 CFR 1910.1200 and 29 CFR 1926.59 regarding all potentially hazardous chemicals to which they may be exposed. In the event that the OSHA regulations regarding other contaminants or hazards become applicable, substance-specific training pursuant to the subject regulation will be performed for the affected project personnel.

Each subcontractor shall have a written Hazard Communication Program in accordance with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and applicable State Department of Health Regulations. Material Safety Data Sheets (MSDS) for all hazardous materials in the work area shall be readily available for employees to review. MSDSs and/or NIOSH Pocket Guides for the

contaminants suspected to be in the various work sites will be placed in a site MSDS Right-To-Know Binder. Copies will be maintained at each work site or some location convenient for employees to review plus a copy will be kept at the MK Project Office and the Subcontractor(s) Project Office.

Hazard Communication training will be included as part of the Site-Specific Training required in Section 4.2. When new chemicals are brought onto the work site or new chemical contaminants are identified, an MSDS and/or NIOSH Pocket Guide will be added to the MSDS Right-To-Know Binder(s) with a corresponding review by the MK SSHO and Subcontractor Job Supervisor(s) and if necessary, training shall be conducted with affected individuals. The MK SSHO has overall responsibility for maintenance of the MSDS database. Subcontractors are responsible for notifying the MK SSHO of new chemicals or substances being used in the work place. Subcontractor Job Supervisor(s) are responsible for reviewing the MSDS, identifying training needs for affected workers and transmitting a copy of the MSDS to the MK SSHO.

4.6 CPR/FIRST AID AND BLOODBORNE PATHOGENS

At least two employees on each shift shall be qualified to administer first aid and CPR. At the minimum, the MK SSHO and each Subcontractor shall have at least one person First Aid/CPR qualified. These personnel are also required to be trained to 29 CFR 1910.1030 (Bloodborne Pathogens) as stated and in accordance with MK IH Procedure 11. Trained first aid CPR personnel shall be identified by hard hat stickers or other means of identification.

4.7 DEPARTMENT OF TRANSPORTATION (DOT) HAZARDOUS MATERIALS TRAINING

All personnel required to classify, mark, select packaging, inspect, load and transport hazardous materials must be trained to 49 CFR Part 172 Subpart H and HM 181. This includes personnel responsible for packaging of samples to be sent to off site laboratories for analysis. Also included are personnel responsible for completing a hazardous waste or hazardous material manifest and insuring the hazardous waste/material is properly prepared for off site shipment.

4.8 SAFETY MEETINGS

Safety meetings for all MK employees and subcontractors personnel shall be conducted on a weekly basis. This group meeting by design will be intended to be a self assessment of safety performance and a chance to review any lessons learned as a group plus an opportunity to introduced specialized training topics. The meeting shall be chaired by the MK General Superintendent and Subcontractor Supervisor(s) with assistance by the MK SSHO and/or subcontractor designated competent safety person. This safety meeting can

also be used to describe any changes in the Site Specific Training described in Section 4.2. Safety Meetings are documented using Figure 4a from this plan or equivalent. A Safety Meeting for all MK personnel and Subcontractor Job Supervisor(s) shall be conducted at least once per month. The monthly meeting is chaired by the MK Project Manager or General Superintendent with assistance from the MK SSHO. Its purpose is to review and rate safety performance and identify any areas requiring additional specialized training. This meeting shall be documented to include date, time, personnel in attendance, topics, and instructor. The Safety Meeting shall be documented using Figure 4a or equivalent.

4.9 PLAN OF THE DAY (POD) MEETINGS

Plan Of The Day (POD) Meetings shall be held at the beginning of each shift to review the planned work of the day as well as any safety and quality concerns. The meeting is chaired by the MK General Superintendent or MK PM. The attendee's include the Subcontractor(s) Job Supervisor, the MK Quality Control representative, the MK SSHO and other selected personnel. The date, time, personnel attending and meeting minutes shall be documented using Figure 4a or equivalent.

4.10 PRE- AND POST-ENTRY BRIEFINGS (MEETING)

Pre-entry briefings shall be held for employees prior to their initiating any new or differing site activity in an exclusion zone and at such other times as necessary to ensure employees are knowledgeable of the work plan activity, the Activity Hazards Analysis, and that the plan and analyses are being followed. Pre Entry Briefs are the responsibility of the Subcontractor Job Supervisor. Attendance shall be documented using Figure 4 from this Plan. In addition, a sign-in and sign-out sheet shall be made available at the CRZ for personnel to sign and record time in and out of the exclusion zone.

Post-entry briefings shall be held as needed to assure changes in conditions or work methods are promptly reported and addressed. In addition, all incidents will be promptly evaluated and the evaluation results will be communicated to personnel in post-entry briefings and other meetings. Lessons-learned from these evaluations shall be communicated to all affected personnel. Post Entry Briefs are the responsibility of the Subcontractor Job Supervisor. They are not required to be formally documented using Figure 4 from this plan, a logbook entry is sufficient.

4.11 QUALITY CONTROL PREPARATORY INSPECTION PHASE MEETING

The MK SSHO shall attend all Quality Control Preparatory Phase Inspection Meetings to discuss any safety and health concerns requiring special attention

and to review anticipated safety requirements for a specific definable feature of work, and to review specific air monitoring required.

4.12 RECORDKEEPING

Written records of all required training and meetings shall be maintained on site by the MK SSHO. These records shall be made available to U.S. Navy personnel upon request. Subcontractors to MK shall provide copies of training certifications along with proof of medical surveillance physical and respirator certification to the MK Project Manager or MK SSHO prior to personnel working on site.

5.0 MEDICAL SURVEILLANCE PROGRAM REQUIREMENTS

All project personnel who work within the exclusion zone for more than three days per month, or are required to use respiratory protection regardless of the time within the exclusion zone, will participate in a medical surveillance program in accordance with OSHA 1910.120 and 1926.65, Section 16 from the MK Safety and Health Program Description for Hazardous Waste Site Operations, and as described in this section. New construction activities will not require participation in the Medical Surveillance Program unless special tasks dictate as determined by the MK SSHO.

The medical surveillance program consists of a baseline or initial examination, an annual medical examination, a termination examination, and episodic medical examinations as necessary. Termination exams specific to this job have been determined to not be necessary unless specific criteria is met as discussed in the MK Safety and Health Program for Hazardous Waste Site Operations, Section 16. Assess the need for termination physicals for both MK and Subcontractor personnel.

At a minimum, the content of the initial, annual and termination examinations shall consist of the following medical tests and procedures (or as determined by the examining physician):

- Medical and occupation history.
- Complete physical examination.
- Pulmonary function test (FVC and FEV₁).
- Complete blood count, generally SMAC-22 or 24 biochemical profile.
- Audiometry.
- Complete urinalysis.
- Resting electrocardiogram.
- Vision screen.
- Chest X-ray (PA) (at the direction of the examining physician).

Special Requirement #1. Pre-employment or pre-task baselines will be obtained for heavy metals via 24-hour urine collection and analysis for each MK employee and subcontractor working in the SWMU #16/16 or #24/00 exclusions zone on a routine basis. Metals analyses will include antimony, arsenic, cadmium, and chromium.

Special Requirement #2. Pre-employment or pre-task baselines will be obtained for heavy metals, specifically cadmium and lead via whole blood collection and analysis for each MK employee and subcontractor working in the SWMU #16/16 or #24/00 exclusions zone on a routine basis during the work campaign.

An episodic examination will be required if any worker develops signs or symptoms related to the possible overexposure to hazardous substances or other health hazards, or that the employee has been injured or exposed above the permissible exposure limits or published exposure levels in an emergency situation. The scope of any episodic examination will be left to the discretion of the examining physician.

A copy of the examining physician's written opinion about the employee's ability to perform work on this hazardous waste site and use respiratory protection, and a statement that the physician has informed the employee of the results of the examination shall be kept on site. Subcontractors must provide this information to the MK Project Manager or the MK SSHO prior to mobilization activities on site. These statements must not contain the specific results of medical examinations or tests.

5.1 DRUG ABUSE PREVENTION PROGRAM

Drug screening is required for work at this site. Results must be provided for all personnel to the MK Project Manager prior to beginning any work at this site. Morrison Knudsen Corporation is committed to the establishment and maintenance of a safe and efficient work environment for all employees free from the effects of alcohol, illegal drugs, other controlled substances, and prohibited items.

5.2 RECORDKEEPING

Arrangements shall be made with the examining physician(s) or others to assure long-term storage of medical records in accordance with 29 CFR 1910.120 and 1926.65. MK will manage medical surveillance records for MK employee's only. The statements by the examining physician(s) attesting to the medical qualification of individual workers shall be maintained at the project site for both MK and the Subcontractor and will remain a part of the project files. The subcontractor's are responsible for all medical records management for their direct hire employees in accordance with OSHA 1910.120 and 1926.65.

6.0 PERSONAL PROTECTIVE EQUIPMENT

In addition to engineering controls and work practices, personal protective equipment (PPE) shall be used to protect personnel from exposure to contaminants which may be encountered during activities on site as warranted. The following guidelines will be followed:

- Respirators and other PPE necessary to protect the health of employees shall be provided by their employer.
- Only NIOSH/MSHA-approved respirators and cartridges shall be used.
- The respirator user's medical status shall be reviewed by the MK SSHO before work is performed requiring respirator use.
- MK IH Procedure 14.0 shall serve as the written standard operating procedure governing the use of respirators at the job site. Section 10 from MK Safety and Health Program Description for Hazardous Waste Operations shall serve as the written standard operating procedure governing the use of PPE at the job site.
- Respirators will be assigned to individual employees for their exclusive use and marked to indicate to whom it was assigned, for the duration of this scope of work.

Table 5 presents the basic levels (Level B, C, Modified D, and D) of PPE.

Table 6 lists the minimum PPE level required for each task or operation. If air sampling/monitoring indicates that modification to the levels of protection are warranted, the SSHO is empowered with the authority to authorize the modification based on the guidance provided in Table 7, Airborne Contaminant Response Criteria.

The PPE has been selected based on the site specific hazards. If conditions change, PPE selection and use shall be reviewed by the MK SSHO. Personnel will be trained if necessary on the use and limitations of specific pieces of PPE prior to initiation of work by their designated supervisors with assistance when necessary from the MK SSHO.

PPE will be maintained and stored in accordance with the manufacturer's recommendation and good industrial hygiene practices. Personnel will inspect PPE prior to each use to assure the PPE is clean and good working order. Training will be provided to personnel concerning PPE inspection criteria if determined to be necessary by the MK SSHO. Where needed, PPE donning

and doffing procedures will be developed or reviewed and personnel will be trained on these procedures by the MK SSHO.

The MK SSHO shall conduct evaluations of effectiveness of PPE. Revisions in PPE selection and use will be made as warranted. The Subcontractor(s) Job Supervisor and/or Subcontractor designated competent safety person in coordination with the MK SSHO shall address medical considerations, including work limitations due to temperature extremes, when assigning or revising PPE requirements to personnel in accordance with MK Procedure on PPE.

7.0 MONITORING AND SAMPLING

Air monitoring refers to direct real-time reading of airborne concentrations, and air sampling refers to time-integrated air sampling (either personal or area samples). Execution of real time air monitoring and/or sampling will be coordinated by the MK SSHO in accordance with the requirements for air monitoring depicted in Table 9.

7.1 GENERAL

This section describes the air sampling and air monitoring program performed to evaluate project worker exposure to potentially hazardous airborne materials and to evaluate off-site impacts. The air sampling/monitoring results will be used to:

- Assess worker exposure to potentially hazardous materials with respect to the Permissible Exposure Limit (PEL) for Air Contaminants (Title 29 Code of Federal Regulations, Part 1910.1000) or other published exposure levels.
- Assess the adequacy of engineering controls and respiratory protection.
- Delineate areas where controls or respiratory protection is needed.
- Establish work control zones.

7.2 MONITORING

7.2.1 Volatile Organic Compounds

A direct-reading, real-time photo-ionization or flame-ionization detection instrument capable of detecting volatile organic compounds (VOCs) will be used whenever excavation and penetration in potentially contaminated areas occurs. Readings will be taken at locations that reflect approximate concentrations of organic vapors and gases in the breathing zone of excavation personnel. Results of the organic vapor and gas monitoring will be documented. If necessary, the level of PPE used by personnel will be modified. Table 7 describes the level of PPE to be used, based on the concentration of organic vapors and gases in the breathing zone of project personnel. The direct-reading real-time organic vapor and gas monitoring equipment will be "response checked" according to the manufacturer's instructions before use each day, and calibrated yearly by the manufacturer or other qualified personnel. Records of

the response check, maintenance, and annual calibration will be maintained on-site.

Colorimetric indicator tubes (such as Dräger tubes) will be used at the SSHO's discretion whenever the direct-reading real-time instrument measures breathing zone concentrations of organic gases or vapors at 2 parts per million (ppm) greater than background concentrations. The following compounds may be measured by colorimetric indicator tubes: benzene, toluene, xylene, ethylbenzene, petroleum hydrocarbons (n-Octane), and trichloroethene (TCE). If benzene or other volatiles are detected, the level of PPE will be upgraded as specified in Table 7, or as determined by the MK SSHO.

7.2.2 Airborne Dust

A direct-reading, real-time instrument capable of detecting airborne dust (such as MIE Miniram) may be used, based on visible observations of excessive dust. Readings will be taken at locations that reflect approximate concentrations of airborne dust in the breathing zone of project personnel. Results of the airborne dust monitoring will be documented. If necessary, the level of PPE used by personnel will be modified or engineering controls enhanced. The direct-reading, real-time monitoring equipment will be "response checked" according to the manufacturer's instructions before use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site. When such monitoring is conducted and the results are greater than 10 mg/m³ total dust concentrations, immediate steps will be taken to determine the cause, modify site operations, evacuate unprotected personnel and the public if necessary, and notify agency contact personnel.

7.2.3 Confined Space Monitoring

Real-time air monitoring shall be conducted for percent lower explosive limit (LEL), oxygen (O₂), hydrogen sulfide (H₂S) and other toxic gases as determined to be necessary by the MK SSHO. Entry into sludge beds, sumps, pits, and open excavations greater than 5 foot depth shall be considered permit-required confined spaces until monitoring for toxic and physical hazards has determined that the space can be entered without a permit. The logic of classification of confined spaces shall follow the requirements established in 29 CFR 1910.146 Appendix A. Monitoring and hazard evaluation must be completed on either a MK "Non-Permit Required Confined Space Work Form" (Attachment IV, Procedure 9 of IH Procedures Manual) or on a "Confined Space Entry Form" (Attachment VI, Procedure 9 of IH Procedures Manual). Monitoring must be conducted for (1) oxygen content to demonstrate that available oxygen is greater than 19.5 % and less than 23.5 %, (2) flammable/explosive atmospheres must be less than 10 % or the lower flammable limit of potential explosive/flammable gases or dusts that may be present, and (3) toxic gases

must be less than either the OSHA PEL or the ACGIH TLV whichever is less or required by law. Any atmosphere of a confined space that cannot be monitored to determine the potential hazard will be considered an IDLH situation and will require engineering controls plus level B PPE depending on the situation for personnel entry into the space. Only personnel suitably trained to conduct hazard evaluations of confined spaces will be authorized to conduct monitoring and testing of atmospheres.

7.2.4 Perimeter Monitoring

Perimeter monitoring to evaluate emissions of airborne dust will be performed periodically, as warranted. When such monitoring is conducted and results are greater than 1.0 mg/m³ (10 times less than the TLV-TWA listed in Section 7.2.2), immediate steps will be taken to determine the cause, modify site operations, evacuate unprotected personnel and the public if necessary, and notify agency contact personnel.

7.2.5 Noise Monitoring

Noise monitoring will be performed, as warranted, by the MK SSHO at the initiation of each task or operation to determine the sound levels associated with the particular task or operation. Sound levels will be determined at locations that best approximate the sound levels at the ear of potentially affected personnel. Noise monitoring equipment will be "response checked" according to the manufacturer's instructions prior to use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site.

7.2.6 Heat Stress and Cold Stress Monitoring

When temperatures at the site are above 65°F, the wet bulb globe temperature (WBGT) may be monitored to assess the potential for heat stress. Work/rest periods will be adjusted according to the guidelines stated in the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents*⁵. When the clothing worn differs from the ACGIH standard ensemble, such as with workers wearing semipermeable or impermeable, the guidelines established in the NIOSH/OSHA/ USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, Section 8 (NIOSH and others 1985) should be consulted. Section 8 of this document is summarized as follows:

When employees are required to wear impermeable chemical protective clothing in temperatures exceeding 70°F, employees shall use the "buddy system" to monitor each other's pulse rate at the start of each rest period. If the pulse rate exceeds 110 beats per

minute, the next work period shall be shortened by one-third without shortening the rest period. The pulse rate shall be monitored again at the beginning of the next rest period, and if the pulse rate exceeds 110 beats per minute, the work period shall again be shortened by one-third. No employee shall be allowed to continue working in PPE if his or her pulse rate exceeds 110 beats per minute continuously.

Table 8 (reprinted from the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*) can be used to establish work/rest periods and the frequency of monitoring pulse rates.

Guidelines for the prevention of cold stress and cold stress threshold limit values (TLVs) shall follow the guidelines stated in EM-381-1-1 Section 06.J and the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents* (OSHA 1993). At air temperatures below 45°F, the air temperature shall be monitored. Below 30°F, the temperature and wind speed shall be monitored and the equivalent chill temperature calculated. Clothing requirements are listed in paragraph 06.J.09, Section 06.J of EM 385-1-1.

7.3 AIR SAMPLING

7.3.1 Organic Compounds

Time-integrated air sampling for aromatic hydrocarbons will be performed whenever the real-time monitoring measures concentrations exceeding 5 ppm for organic gases or vapors for more than 5 consecutive minutes. Samples will be taken with personal air sampling pumps from the personal breathing zone. Time-integrated air samples will be collected and analyzed for aromatic hydrocarbons at the SSHO's discretion. The air samples will be collected and analyzed in accordance with NIOSH Method 1501 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Passive dosimeters may be used in place of air sampling pumps. Analysis of all air samples will be performed by an American Industrial Hygiene Association (AIHA) accredited laboratory.

7.3.2 Inorganic Lead

Time-integrated air sampling for inorganic lead using personal air sampling pumps will be performed at the MK SSHO's discretion whenever the potential for lead exposure exists. The air samples will be collected and analyzed for inorganic lead in accordance with NIOSH Method 7082 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first inorganic lead

contaminated work area to determine the level of compliance necessary with the OSHA Lead Standard, 29 CFR 1926.62.

7.3.3 Cadmium

Time-integrated air sampling for cadmium will be performed at the MK SSHO's discretion whenever the potential for cadmium exposure exists. Personal air sampling pumps will be used for sampling. The air samples will be collected and analyzed for cadmium in accordance with NIOSH Method 7048 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first cadmium contaminated work area to determine the level of compliance necessary with the OSHA Cadmium Standard, 29 CFR 1926.63.

7.3.4 Inorganic Arsenic

Time-integrated air sampling for inorganic arsenic will be performed at the MK SSHO's discretion whenever the potential for inorganic arsenic exposure exists. Personal air sampling pumps will be used for sampling. The air samples will be collected and analyzed for cadmium in accordance with OSHA Method ID105 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first inorganic arsenic contaminated work area to determine the level of compliance necessary with the OSHA Inorganic Arsenic Standard, 29 CFR 1926.1118.

7.3.5 Explosives Residues

Time-integrated air sampling for explosives residues will be performed at the SSHO's discretion whenever the potential for airborne explosive residues exposure exists. Contaminants and analytical method are listed below:

<u>Contaminant</u>	<u>Method</u>
TNT	OSHA #44
RDX (Cyclonite)	OSHA CIM
HMX	OSHA CIM

Two full-shift personal validation samples will be taken in the first work area representing the maximal exposed individual to validate compliance with the established OSHA PELs and the effectiveness of the engineering controls. Prior to mobilization, the MK SSHO will discuss a sampling strategy with the analytical laboratory to determine the best combination of filter cassettes and sorbent tubes to effectively analyze more than one contaminant per filter media.

7.3.6 PCB Hazards

Air monitoring samples for PCBs are not anticipated. However, if soil significantly contaminated with PCB oil is encountered, then two personal samples shall be collected using the maximum exposed individual(s) in accordance with NIOSH Method 5503. The samples will be collected during the follow-on soil removal activities if any person(s) will be within 15 feet of the soil movement.

7.4 AIR MONITORING AND SAMPLING REQUIREMENTS

Air monitoring and sampling requirements are shown in Table 9.

7.5 RECORDKEEPING AND CHAIN OF CUSTODY

Written records of all monitoring will be maintained on-site. Affected employees will be notified of monitoring results representative of their exposure. Chain-of-Custody (COC) Records will be used for industrial hygiene sampling requiring the collection and shipment of a sample to an approved analytical laboratory. A COC Record will be properly completed and accompany all collected samples in accordance with MK Industrial Hygiene Procedures Manual, Procedure 7.0, *Analytical Laboratory Procedures* (MK 1994a). The selected AIHA-accredited industrial hygiene lab will be American Analytical Laboratories, Inc., Akron, Ohio (216-535-1300) or a local laboratory if one is found. Turn-around time is estimated to be 5 to 10 working days.

Workers will be notified of time-integrated sampling results via memo to the designated supervisor. The Navy will receive all sampling records and results as part of the Close-Out Report.

8.0 GENERAL SAFETY RULES

8.1 GENERAL

Operations shall be conducted in a safe manner consistent with the policies and procedures outlined in this SSHP. The number of personnel shall be restricted to the minimum necessary to complete the required work as an administrative control to limit personnel exposures to potential site chemical, physical and biological hazards.

All project and subcontractor personnel assigned to this project are responsible for following this SSHP unless modified in the subcontracting special conditions document, for using safe practices, and for wearing the PPE specified by the MK SSHO. Project personnel shall report hazards and unsafe conditions and practices to the MK SSHO. All federal, state and local occupational health and safety regulations must be complied with by project personnel. Violations of project procedures may include disciplinary measures up to and including termination.

8.2 RULES AND PROCEDURES

- The Subcontractor shall have available a 40-lb rated ABC multipurpose dry chemical fire extinguisher (or two 20 lb ABC's); first aid kit including CPR kit (Pocket Mask) and biohazards control kit; emergency eyewash and drench; and spill response equipment available at every controlled work location. Also, the Subcontractor shall complete the Work Zone Map and post it at each work site including emergency phone numbers. Work zone signs shall be posted in accordance with the requirements of Section 9.4 of this SSHP.
- Avoid driving over dry grass that is higher than the ground clearance of the vehicle. Catalytic converters on the undercarriage of vehicles are sufficiently hot to ignite dry prairie grass. Never allow a vehicle with a warm undercarriage to sit in a stationary location over dry grass or other combustible materials.
- Do not eat, drink, smoke, take medications, chew gum or tobacco, or put objects in mouth while in the exclusion zone and contamination reduction zone or when handling samples.
- After handling samples, thoroughly wash hands and, if necessary, face, before eating or putting anything in mouth (i.e., avoid hand-to-mouth contamination).

- At a minimum, wear hard hats, safety glasses and steel-toed boots when inside the work boundaries.
- Remain a safe distance from the excavation equipment when not involved in operation or monitoring activities.
- Do not under any circumstances enter or ride in or on any backhoe/excavator bucket, materials hoist or any other device not specifically designed for carrying human passengers.
- Remain aware of your own and other's positions with regard to rotating equipment and be extremely careful when assembling, lifting and carrying items that may cause pinch point injuries and collisions.
- Be alert to the symptoms of fatigue, heat stress and cold stress and their effect on the normal caution and judgment of personnel.
- Use explosion proof sampling equipment and tools.
- Use ground fault circuit interrupters (GFCI) with all electrical tools and equipment.
- Stand clear of trenches during excavation. Always approach the excavation from upwind.
- Stand upwind, whenever possible, of excavations and other sites where the soil has been disturbed.
- Be alert to potentially changing exposure conditions as evidenced by perceptible odors, unusual appearance of excavated soils, oily sheen on water, or other evidence of possible contamination.
- Do not enter any excavation or trench greater than five feet in depth unless authorized by the MK SSHO.
- Keep hand tools off the ground and centrally located on a plastic cover or area of no contamination whenever possible to avoid tripping hazards and the spread of contamination.
- Use the buddy system at all times while working at the site in controlled work zones. No one is to work alone in the Exclusion Zone or Contamination Reduction Zone without permission from the MK SSHO and MK General Superintendent.
- Minimize truck tire disturbance of all stabilized sites and areas beyond the work area boundaries.

- Cease all work operations on the site at sunset unless the control zone is adequately illuminated with artificial lighting.
- Subcontractor Job Supervisors shall attend the POD meeting prior to the start of the work and conduct pre and post entry briefs with all affected workers. All personnel shall sign and record the time in and out of all Exclusion Zones.
- Avoid direct contact with contaminated materials unless necessary for sample collection or required observation. PPE shall be worn at all times, as required.
- Remove disposable clothing and follow decontamination procedures.
- Always use an appropriate level of personal protection as assigned in this SSHP. Lesser levels of protection can result in otherwise preventable exposure.
- Maintain a high level of awareness of the limitations in mobility, dexterity and visual impairment inherent in the use of Level B and Level C PPE.
- Establish prearranged hand signals or other means of emergency communication when wearing respiratory equipment, since this equipment impairs speech communication.
- Wear hearing protection if you have to shout to communicate at a distance of three feet in steady-state (continuous) noise or when you expect loud impact noise from certain activities. The MK SSHO will assess potential noise exposure and provide recommendation on correct hearing protection.

9.0 WORK ZONES

Where a potential exists for worker exposure to hazardous substances, safety, or health hazards, work zones will be established, and the flow of personnel and equipment will be controlled. The establishment of work zones will ensure that personnel are properly protected against hazards present in the work area, work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

Prior to the commencement of field activities, Work Zones shall be established by the Excavation Subcontractor with the approval of the MK SSHO as necessary to meet operational and safety objectives. These work zones will be depicted on Work Zone Maps that are field prepared by the Excavation Subcontractor to be posted by the Subcontractor Job Supervisor near the entrance to the work area. In addition to the zones, these maps should show assembly points; evacuation routes; location of first aid equipment, fire extinguisher and eye wash/drench and spill containment equipment; and emergency communications equipment. One copy of the work zone maps and all revisions shall be delivered to the MK SSHO by the Subcontractor Job Supervisor to be retained by the MK SSHO in Appendix B of the field master copy SSHP. Posted with the Work Zone Map shall be the list of emergency phone numbers and route map to hospital. The Excavation Subcontractor shall maintain a sign-in and sign-out log at the entrance to the Contamination Reduction Zone (CRZ) for personnel entering the Exclusion Zone (EZ).

9.1 EXCLUSION ZONE

The exclusion zone (EZ) is the area where hazardous substances are present or expected to occur, or health and safety hazards are present. Entry into this area is limited to personnel required to perform the work who are wearing the specified PPE and have attended a Pre-Entry Briefing. Everyone entering the EZ shall have completed the required health and safety training and will participate in the medical surveillance program as necessary. The boundary of the EZ will be determined for each activity and may change depending on activities and conditions.

An EZ will be established to encompass the contaminated area. For this project, the EZ for each soil excavation area will consist of the immediate area of excavation extending outward for approximately 20 feet. The EZ will include the excavated soil classified as potentially contaminated that may be stockpiled.

The EZ will be clearly delineated with signs, barricade tape, fences, or other suitable means. Access control points will be established to regulate the flow

of personnel and equipment in an out of the zone and to help verify that proper procedures for entry and exit are followed. PPE levels in the EZ (refer to Section 6) are initially scoped as Level C, depending on the task listed in Table 6. Decontamination will follow guidelines established in Section 10. Gross contamination will be removed in the EZ followed by additional decontamination in the CRZ. The MK SSHO will monitor activities in the EZ from his position in the CRZ. The boundary line from the EZ to the CRZ will be based on the following criteria:

1. Approximately 20 feet outward from contaminated work area, or as much as necessary, to include the heavy equipment operating in the zone and the temporary staging of any potentially contaminated soil.
2. Perimeter air monitoring for VOCs if necessary reads no increase in ppm-equivalents above background and the portable dust/aerosol monitor shows no increase in concentration above background. Background is considered the Support Zone (SZ) area.

9.2 CONTAMINATION REDUCTION ZONE

The Contamination Reduction Zone (CRZ) is the transition area between the contaminated area (the EZ) and the clean area (the SZ). While designed primarily to reduce the possibility of the support zone becoming contaminated or affected by EZ activities, the CRZ is also used for decontamination of personnel and equipment. No personnel or equipment will be allowed to exit the EZ or CRZ without being properly decontaminated, except in emergencies. The CRZ is designated as the immediate area around the EZ, extending outward approximately 20 feet or as much as necessary, to accommodate the complete length of the longest piece of heavy equipment. Additionally, the immediate area extending outward for approximately 10 feet from the decontamination facility will be designated as the CRZ.

Used PPE will be removed and stored in properly marked 55-gallon drums or other containers for disposal. Work clothing will also be removed and stored in lockers. Personnel washing and shower facilities will be provided. Provisions for decontamination of construction and field equipment along with soil sampling equipment will be implemented as necessary.

9.3 SUPPORT ZONE

The support zone (SZ) consists of all areas outside the exclusion and contamination reduction zones, but within the project site. The SZ is used for all site activities that are not limited to the EZ or CRZ equipment and material storage, offices, parking, etc. Logs will be maintained of the Pre-Entry Briefing in the SZ to record the names, companies, and reason for entry into the CRZ or EZ. The SZ will also serve as the staging area for all activities.

9.4 WORK ZONE CONTROLS

Before site operations begin, the SZ site office/decontamination facility will be identified with signs stating that all visitors are required to stop and inform site personnel of their presence on the work site.

The Subcontractor shall post signs at entrances to the CRZ and EZ stating the following:

HAZARDOUS AREA KEEP OUT
DANGER
AUTHORIZED PERSONNEL ONLY
PERSONAL PROTECTIVE EQUIPMENT IS REQUIRED IN THIS AREA

In addition, at the entrance to the CRZ, post sign stating the following:

NO SMOKING, DRINKING, OR EATING BEYOND THIS POINT

The following requirements will apply to all personnel entering the CRZ or EZ:

- The use of the buddy system is mandatory. No one will be allowed to work alone in the CRZ or EZ without permission from the SSHO.
- No smoking, eating, drinking, chewing tobacco or gum, or application of cosmetics within the CRZ or EZ.

The following traffic rules will apply to all motorized vehicles and equipment while on-site:

- Equipment carrying waste shall always have the right-of-way, except for emergency vehicles.
- The speed limit is 10 mph, or as posted. Exceeding the speed limit is cause for disciplinary action, including termination of employment.
- Personnel will not ride equipment that has not been specifically designed for the transport of personnel.
- Seatbelts shall be worn at all times when operating any motorized equipment or vehicle.
- At a minimum, during service and maintenance of motorized equipment, the key shall be removed and in possession the service or maintenance person and a "Do Not Operate" tag signed by this person shall be displayed near the start-up controls.

- Daily safety checklists shall be completed by equipment operators and delivered to the MK Site Project Office on a daily basis. The checklist will be based on the equipment manufacturer guidelines for daily checks, using a format established and prepared by the owner/operator/subcontractor.

10.0 PERSONNEL AND EQUIPMENT DECONTAMINATION AND HYGIENE PROCEDURES

All personnel, clothing and equipment leaving an exclusion zone (contaminated or potentially contaminated area) shall be inspected and, if necessary, decontaminated to remove any potentially harmful substances that may have adhered to them. Some equipment/clothing may be disposed of rather than decontaminated. In this case, the used PPE and/or equipment (e.g. disposable sampling equipment) will be stored in properly marked, plastic lined 55-gallon drums in the CRZ. A Decontamination Facility will be constructed for personnel decontamination and for equipment decontamination. This section gives guidelines regarding the decontamination procedures to be implemented. Final details will be described during the site-specific safety and health briefing prior to commencing field operations.

10.1 PERSONNEL DECONTAMINATION

Decontamination (decon) stations will be established in the CRZ. The decon stations will consist of the following, as appropriate:

- Equipment drop.
- Portable High-Energy Particulate Air (HEPA) vacuum for vacuuming PPE before removal.
- Boot wash station consisting of a boot pick for mud removal, a tub of water, detergent with brushes for cleaning, and another tub of water for rinsing.
- Glove wash station similar to boot wash station.
- Sampling equipment wash station (similar to boot wash station).
- Disposable clothing drop and work clothing drop. All contaminated or potentially contaminated disposable clothing shall be placed into labeled 6-mil plastic bags for disposal as contaminated waste. Work clothing will be required to be placed into labeled 6-mil plastic bags for laundry servicing if potentially contaminated as a result of ripped or torn disposable clothing or other abnormal conditions.
- Personal showers and washing facilities will consist of water, towels, and soap. Street clothing shall be stored in lockers provided in the personnel decon facility "clean side."

10.2 EMERGENCY PERSONNEL DECONTAMINATION

Based on the type of emergency that is postulated, the following types of response actions are anticipated for personnel emergencies within the exclusion zone.

- A. Critical Triage Condition (life threatening) - Emergency evacuation or extrication from the exclusion zone to contamination reduction zone where emergency medical treatment and stabilization will be attempted until arrival of first responding medical unit. Or, emergency medical treatment and stabilization will be completed in the exclusion zone till arrival of first responding medical unit. In either case, gross decontamination will be completed to the extent possible by removal PPE, wiping patient down to remove contamination and/or wrapping patient to prevent spread of contamination.
- B. Marginal Triage Condition (non life threatening) - patient will be evacuated from exclusion zone and treated in the contamination reduction zone followed by decontamination and patient preparation for transport to emergency medical facility. Decontamination could occur first followed by medical treatment in selected scenarios.

10.3 EQUIPMENT DECONTAMINATION

All equipment and tools used in the EZ will be inspected for contamination before removal from the EZ. Any equipment and tool with visible contamination will be cleaned before removal from the EZ. A water and detergent solution will be used for highly contaminated equipment, followed by a high-pressure hot water rinse, if necessary. All water used during decontamination will be contained for treatment and/or disposal. Some construction and field equipment will be decontaminated at the temporary decontamination facility. After gross contamination is removed, affected surfaces of the equipment will be wrapped in plastic and transported.

10.4 WASHING FACILITIES

A washing facility may or may not be available in the SZ. The washing facility will consist of water, soap, and towels for personnel, as necessary. If a washing facility is not available, SZ personnel will be allowed to use the washing facilities in the CRZ.

10.5 DECONTAMINATION WASH WATER

Personnel decon stations, equipment decon areas, and washing facilities will be designed to collect all wash and rinse waters into 55-gallon drums or a larger temporary storage container. The tank, if used, will be of sufficient volume to allow for collection and temporary storage of decontamination water and rinse water from the CRZ and vehicle decontamination. Decontamination water will be disposed of via the on-site sewage treatment facility or shipped off-site for disposal.

10.6 PERSONAL HYGIENE

Eating, drinking, and the use of tobacco or cosmetic products are prohibited in the CRZ and EZ. Personnel exiting the controlled areas are required to thoroughly wash their hands and face before eating, drinking, smoking, or using toilet facilities. End-of-work-shift showers may be required with change to street clothes. Adequate toilet and lunchroom facilities free of contaminants must be made available.

11.0 ON-SITE FIRST AID AND EQUIPMENT

11.1 FIRST AID AND MEDICAL FACILITY REQUIREMENTS

At a minimum, 16-unit first aid kits shall be maintained by MK in their office trailer and each of the Subcontractors shall maintain a first aid kit at their office trailer and have sufficient supply of kits for each of the work sites. The location of the first aid kit shall be communicated to project personnel as part of the site-specific and pre-entry brief training. Included with the first aid kit shall be a CPR Pocket Mask and a biohazards control kit (used to clean up incidents involving body fluid's). The MK SSHO can require upgrades to the first aid equipment requirements as deemed necessary for this job.

An emergency eyewash/drench kit, fire extinguisher and spill control kit shall be available at each controlled work area. The Subcontractor is responsible for furnishing their office trailers and each controlled work location with this equipment as stated in Section 8.2 of this SSHP. The emergency phone number list and route map to medical facilities shall be posted at each office trailer and at each controlled work zone as part of the Excavation Subcontractor prepared Work Zone Map.

11.2 REPORT OF FIRST AID CASES

All first aid cases, accidents and incidents shall be promptly reported to the MK SSHO. The MK SSHO shall immediately notify the Navy Technical Representative (NTR) or the Navy Officer in Charge of Construction (ROICC) of all injuries even if preliminary information is available. The MK SSHO and MK PM shall follow the guidance presented in MK NAVFAC SOUTHDIV Procedure PHSP-0004.1 titled Incident Reporting dated 3/2/95.

The MK Charleston Project Management Office (PMO) should be notified shortly after notification to the Navy's designated authority. If an on-site official cannot be reached, the MK Charleston PMO still should be promptly notified at (803) 554-0100.

A written report of the injury must be provided to the ROICC or REICC and MK Charleston PMO within 24 hours of the incident via memo form. This report is to include as attachments:

- a. Employer's First Report of Injury (Workman's Comp Insurance Form)
- b. Supervisor's Accident Investigation Report (MK Form CAS 24/77)
- c. Accident Data Report (MK Form 6783/91)

- d. Any records provided by the Medical Service Provider such as 1) Hospital Emergency room Report, 2) Examining Physician's designation of work restriction, and 3) Examining Physician's Work Release.

12.0 EMERGENCY RESPONSE PLAN AND CONTINGENCY PROCEDURES

This section describes a contingency plan to be implemented in the event of injuries, illnesses, accidents, and fires. The contingency plan provides guidelines for the proper response to emergencies, but the actual response will depend on the situation.

12.1 GENERAL

This section describes a contingency plan to be implemented in the event of injuries, illnesses, accidents, and fires. The contingency plan provides guidelines for the proper response to emergency situations, however the actual response will depend on the situation.

In the event of an emergency, the MK SSHO, MK General Superintendent and/or Subcontractor Job Supervisors will direct all personnel to take appropriate action which could include any or all of the following:

- Evacuate all personnel involved to a safe place of refuge.
- Notify emergency services using phone numbers identified in Table 2.
- Initiate emergency response action.

12.2 PRE-EMERGENCY PLANNING

During mobilization activities for this project, the MK Project Manager, MK General Superintendent, Subcontractor Job Superintendents and the MK SSHO shall review the NAVFAC SouthDiv Project Procedure PHSP 002.1 and execute the steps necessary to assure effective emergency response requirements and resources are established for this project.

In addition to the guidance provided in this document and the preconstruction meeting, all safety meetings and pre-entry briefs shall include emergency response preplanning specific to each task and work site as a topic area. This training will include:

- Assembly Points. If the work activity may result in a release of hazardous substances, more than one assembly point will be specified to ensure that at least one upwind assembly point is accessible. This also pertains to fires and sites subjected to adverse weather conditions. Information must be included on the Work Zone Maps to be completed by the MK Subcontractor(s).
- Emergency Response Coordinator. The MK SSHO, as the onsite emergency response coordinator, will contact the emergency

response providers, account for individuals at the assembly point, and plan the appropriate response.

- **Evacuation Routes.** Routes will be specified as needed. Information must be included on the Work Zone Maps.
- **Means of Evacuation.** The number of personnel that may be evacuated from the work site by various routes will be evaluated by the MK SSHO.
- **Means of Communication.** This will include the means of alerting personnel to an emergency at all points in the work site and should consider the sound screening potential of hearing protection, distance and noisy equipment when specifying the use of alarms, horns and sirens. The means of communication with emergency response providers will be considered. Information must be included on the Work Zone Maps.
- **Designation of a location for first aid services, fire extinguisher(s) and spill control equipment.** Information must be included on the Work Zone Maps.
- **Procedures to be followed by employees who remain to manage critical operations to insure safe shutdown.**

12.3 RESPONSIBILITIES

The following is a description of personnel roles, lines of authority, and the emergency response communication/notification responsibilities for site personnel.

12.3.1 Project Personnel

It is the responsibility of all project personnel to recognize conditions that have the potential for resulting in a personal injury or damage to property, and to report the condition immediately to their supervisor or the MK SSHO.

12.3.2 MK Project Manager (PM)

The MK PM is responsible for assuring adherence to the administrative elements and implementation of the Emergency Response Plan, as referenced in this document. He will evaluate the site's preparedness for emergency responses and identify special conditions which may require additional preparations. He will ensure that necessary equipment and facilities are provided to support this plan.

12.3.3 MK Certified Industrial Hygienist (CIH)

The CIH is responsible for preparing the Emergency Response Plan (this section of the SSHP). The CIH will develop and review the Emergency Response Plan, evacuation plans, and oversee implementation at the site. The CIH will ensure that supervisors and employees meet the training requirements of the plan and approve the equipment used in the plan. The CIH may designate duties on site to the MK SSHO. The CIH is the designated Health and Safety Manager based in Boise, ID.

12.3.4 MK Site Safety and Health Officer (SSHO)

The MK SSHO is responsible for directing response actions to emergency situations. He will coordinate with project management to ensure the availability of response equipment and supplies, and initiate drills. Emergency response plans will be evaluated over the course of the project by the MK SSHO to keep them up-to-date and to ensure that they are applicable and relevant to emergency response organizations.

12.3.5 Subcontractors

All MK and Subcontractor personnel will comply with the provisions of this plan and participate in training as required to implement response procedures. All personnel will be cognizant of their work areas and notify their supervisors and the MK SSHO of hazards at the site.

12.4 EMERGENCY RECOGNITION AND PREVENTION

Site personnel shall be apprised of hazards and life-threatening emergency situations during site-specific training to include the project kickoff site specific training, safety meetings and briefs. Means to control hazards and mitigate emergency situations will be addressed at that time.

12.5 SAFETY ZONES

Suitable assembly points will be established at the start of the project for each work site. These assembly points will provide a safe point of refuge for site personnel. Additional information will be provided in the site briefing concerning other hazards that may arise at the site. Safety Zones or assembly points must be included on the Work Zone Map.

12.6 SITE SECURITY AND CONTROL

At all times, site personnel working in an area in the near vicinity of an emergency situation shall be apprised of the emergency as soon as possible. Only authorized personnel shall be allowed into the emergency area. As

necessary, the emergency area may be cordoned off and access restricted by MK and the Subcontractors.

12.7 EVACUATION ROUTES

Evacuation routes will be established based on scope of work, location of work and atmospheric conditions. Evacuation routes shall be posted in various locations on the site if necessary and included on the Work Zone Map. All site personnel will be made aware of evacuation procedures during site-specific training especially pre entry briefings. Topography, layout and prevailing wind conditions shall be considered in establishing evacuations routes and assembly points.

12.8 EMERGENCY DECONTAMINATION

In the event an employee is injured or becomes ill and requires hospital treatment, the extent of decontamination to be performed will be assessed based on severity of the injury or illness and time delay that decontamination may cause. Refer to Section 10.2. If the employee has any signs of contamination, the ambulance and hospital staff will be notified of this and the nature of the contamination. Reasonable effort will be expended to decontaminate the victim prior to removal from the site. The medical facilities shall be notified by the MK SSHO of the intended scope of work and the potential for contaminated personnel. The medical facilities will receive copies of all the Material Safety Data Sheets (MSDSs) and/or NIOSH Pocket Guides applicable to this project. The MK SSHO shall contact the medical facility to establish a contact person for the necessary information.

12.9 EMERGENCY MEDICAL TREATMENT AND FIRST AID

See Section 11.

12.10 COMMUNICATIONS

The MK SSHO, the MK General Superintendent and the Subcontractor Job Supervisor(s) at each work site area shall be equipped with two-way radios for communications on site as warranted. Additional communications with outside emergency services will be accomplished through the use of cellular telephones if necessary. Both two way radios and cellular phones are to be used for emergency's only. In the radios will be used for standard field construction communication, then the MK SSHO shall establish strict protocols for radio communication and insure all personnel who carry radios understand the protocols.

12.11 CRITIQUE OF RESPONSE AND FOLLOW-UP

All actual emergencies shall be critiqued and follow-up corrective actions shall be implemented as needed. Drills and exercises if completed shall also be critiqued. The critique will be conducted as part of a safety meeting first by supervisory personnel and second with all MK and Subcontractor personnel.

12.12 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS

All emergencies will be promptly reported to the Emergency Response Number (X3300), the Environmental Department (X1132, X3114, or X6160), and to the MK SSHO. The MK SSHO will ensure that the NSWSC Site Representative is notified promptly and will direct initial emergency response actions until the arrival of the NSWSC Site Representative. The NSWSC Site Representative can include the officer in charge of security, fire department and/or ambulance services, or the Environmental Protection Department Manager or designee.

The following initial response actions are to be taken by MK personnel and subcontractors at the work site for various types of incidents.

A. Incident Type: Fires in Vehicles and Mobile Equipment, Process Equipment, and Support Structures.

Response Actions:

1. Notify the NSWSC Crane Security Desk at extension 3300, and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and any potential material release.
2. MK SSHO, MK General Superintendent or Subcontractor Job Supervisor designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory assumes initial command of the situation and directs personnel to do one of the following:
 - a. Emergency shutdown of process equipment or mobile equipment, evacuate the work zone or immediate area to a safe place of refuge, meet the incoming response units and provide all available information.

- b. Initiate first fire attack and knockdown using available fire extinguishing equipment followed by evacuating the work zone or immediate area.

B. Incident Type: Preparation for Adverse Weather Condition to Include High Winds, Tornado, Heavy Rains, Snow and Ice Conditions.

Response Actions:

1. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory notifies the NSWCrane Security Desk at extension 3300 and provides the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of the work site(s).
 - c. Preparation for adverse weather condition has begun.
 - d. Permanent structure location where personnel will be relocating to on Base.
2. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory will direct personnel to shutdown operations, secure loose materials, and park and secure mobile equipment. Personnel shall be directed to report to a permanent building after completing decontamination procedures.
3. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory will complete accountability and await clearance from Base Security to resume operations or other action.

C. Incident Type: Medical and Rescue Emergencies.

Response Actions:

1. Notify the NSWCrane Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and any exposure to hazardous material.
2. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory designates one person to meet the emergency response units at the nearest road where the units will be approaching.

3. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory assumes initial command of the situation and completes or directs personnel to do one or both of the following:
 - a. Emergency shutdown of process equipment or mobile equipment and any other necessary action to mitigate or control the incident.
 - b. Initiate emergency first aid actions until arrival of emergency units.
4. For Confined Space Rescue, only emergency rescue units trained in confined space rescue shall enter the confined space. **The Designated Attendant for that work space must never enter the space as a rescue attempt unless relieved of attendant duties and assigned as a member of the trained rescue team by either the MK SSHO or the responsible supervisor for the confined space entry.**

13.0 LOGS, REPORTS, AND RECORDKEEPING

13.1 SAFETY AND HEALTH LOGBOOK

The MK SSHO shall maintain a Project Safety and Health Logbook for the duration of work activities at the site. Entries in the logbook shall be time sequenced. The entries must be written in ink and the bottom of each page must be signed. The logbook shall be hard bound. No pages will be removed from the log book. Corrections must be lined out and initialed. The logbook will contain specific information recorded on a daily basis utilizing the Form shown in Figure 6.

A separate file folder shall be maintained for Figure 6. Additional forms supporting Figure 6 shall be attached to Figure 4 and held in file folder. Separate file folders shall be established for this SSHP; calibration data sheets if not attached to Figure 6; safety and IH instrument serial numbers and shipping papers; field specific safety and health procedures; all safety and health related permits; and weekly safety inspections. Records of training and site orientations; briefings including pre entry briefs; Subcontractor prepared equipment inspection sheets and exclusion zone sign-in and sign-out logs shall also be maintained in file folders by the MK SSHO.

13.2 REPORTS

A weekly site safety and health inspection report shall be prepared by the SSHO. This report shall identify work activities, safety and health-related deficiencies, and corrective measures. As a minimum, the checklist shown in Figure 7 shall be completed by the MK SSHO. All near miss incidents and incidents that result in property damage, personnel injuries or illness will be investigated and notification/reporting requirements shall be followed in accordance with PHSP 004.1.

13.3 FIELD MASTER COPY OF SSHP

The MK SSHO shall maintain a field master copy of this SSHP document to include all redlines and the completed work zone maps. This copy shall be properly filed with project records at the completion of the project to be sent to MK PMO office in Charleston.

13.4 RECORDKEEPING

The MK SSHO shall maintain records of all injuries and illnesses for MK employees only incidental to the work in accordance with 29 CFR 1904, including copies of the Worker's Compensation First Report of Injury.

Accidents and Incidents data reporting requirements shall be managed in accordance with MK NAVFAC SOUTHDIV Procedure PHSP-0004.1 titled Incident Reporting dated 3/2/95 for both MK and Subcontractor personnel as stated in Section 11.3.

The MK SSHO shall receive copies of all records for injuries and illnesses of Subcontractors incidental to the work, including copies of the Worker's Compensation First Report of Injury. These records will be maintained on the Subcontractors OSHA 200 Log. Reporting shall follow the guidance stated above. A record of all first aid treatments not otherwise recordable shall be maintained and furnished to the Navy's designated authority upon request. The SSHO shall maintain records of employee exposure to potentially harmful toxic materials, harmful physical agents and medical records, in accordance with 29 CFR 1910.120. Workers will be notified of time integrated sampling results via memo to his employer.

13.5 SAFETY AND HEALTH PROJECT COMPLETION REPORT

The MK SSHO shall complete a safety and health project completion report at the conclusion of the field work. The purpose of the report is to a self assessment summarizing effectiveness of the safety and health program implemented in the field; lessons learned and suggestions for program improvement; accident and incidents; air monitoring and sampling results including ratings on instrument useability; and how well the original prepared Activity Hazards Analysis (AHA) worksheets reflected field conditions. The report shall be directed to the MK SouthDiv Program Health and Safety Manager within ten working days after project task demobilization.

14.0 ON-SITE WORK PLANS

A site-specific Work Plan was developed to define the work tasks and identify the work objectives. The means and personnel required to complete the task are identified along with consideration for methods, logistics, quality control/quality assurance, and resources. This SSHP is a supplement to the Work Plan.

15.0 COMMUNICATION PROCEDURES

This section describes communication procedures and equipment.

15.1 RADIO COMMUNICATION

At a minimum, the MK SSHO and construction supervisors shall be equipped with two-way radios for on-site communications, as warranted by the number and proximity of work sites. Two-way radios will not be available from the base. MK will lease radios per requirements specified by the Security Chief. The MK SSHO will obtain information on radio unit designation and communication protocols and brief the construction supervisors. In certain areas, two-way radio communication is restricted due to explosive operations.

15.2 TELEPHONE

If not restricted by explosive operations, a cellular telephone shall be available for emergency communications if no other telephone is readily available. At each job location, the Supervisor is responsible for verifying the location of the nearest telephone and informing the workers at the Pre-Entry Briefing.

15.3 EMERGENCY ALARM

An emergency alarm, such as an air horn, shall be available at each major work site to warn personnel of an emergency. Personnel shall be trained on actions they are to take if the alarm is sounded to include evacuation routes and assembly points. During this project, use of audible alarm may not be necessary and voice contact should be sufficient for emergency annunciation. The MK SSHO will make this decision. The buddy system shall be used always while operating at this project. The job supervisor along with the MK SSHO shall establish prearranged handsignals, as a backup to voice communications, in cases such as wearing respirator equipment and confined space entry.

15.4 DRILLS AND EXERCISES

Drills and exercises shall be conducted to ensure that communication methods are adequate. The SSHO will test the two-way communication to confirm emergency communication using NSWCC Crane recommended protocols. No field exercises are planned at this time.

16.0 SPILL CONTAINMENT PLAN

Spill and release accident scenarios during remediation could occur and involve residue process material and reinstates from decontamination activities. The following information will be used by project personnel to respond to and mitigate any releases on the project site. In the event of a spill or release, the MK SSHO, MK General Superintendent and/or Subcontractor Job Supervisors will direct all personnel to take appropriate action which could include any one or all of the following:

- Initiate spill response action and notify emergency services.
- Notify emergency services as identified in Table 3.
- Evacuate the work zone to a safe place of refuge.

16.1 PREPLANNING FOR SPILL CONTROL

Remedial construction activities will be reviewed for release potential and the capability of on-site personnel to adequately respond. Base personnel will be contacted to determine their capability to respond to various releases. All aspects of the Emergency Response Plan as described in Section 12, will be reviewed by site personnel to ensure adequacy and that resources are available.

During mobilization activities for this project, the MK Project Manager, MK SSHO, MK General Superintendent and Subcontractor Job Supervisor(s) the SSHO shall review the NAVFAC SouthDiv Project Procedure PHSP 003.1 and execute the steps necessary to assure effective spill response planning requirements and resources are established for this project.

MK will cooperate with the base; other site contractors; and federal, state and local directors of emergency preparedness and response to ensure a coordinated effort in preparing for a spill emergency, with response plans that are compatible and integrated. Prior to the start of work, MK will review the above listed documents and meet with site representatives on spill control and assure the SSHP is consistent with site requirements for spill control. Specific roles and responsibilities will be reviewed for MK and Navy personnel. The Base Fire Department will be notified of any spills classified above operational and will assist in spill containment. The Base Fire Department will provide overall command and control of the clean-up activity for spills classified above operational until relieved by a higher authority.

16.2 SPILL AND FIRE CONTROL MATERIALS AND EQUIPMENT

When planning to move or handle drums (or other containers) containing hazardous or special waste materials, the following shall be kept available in areas where spills, leaks or ruptures may occur: 1) salvage drums and container overpacks (approved by the U.S. Department of Transportation); 2) suitable

quantities of proper absorbent materials; 3) portable containing material; 4) neutralizing agents; 5) fire extinguisher(s); 6) emergency eyewash/drench station; and 7) spill pallets or platforms for secondary containment.

Drums and containers used during a clean-up will be appropriate to the hazardous substances they are meant to contain, and will meet the regulations promulgated by DOT, 49 CFR Parts 171-179, OSHA 29 CFR 1910.120, and EPA 40 CFR 262. Drums and containers will be inspected for defects and their integrity assured prior to being filled with any non-solid hazardous or special waste substance.

A spill of material can be contained with porous or absorbent barriers. Absorbent materials can take several configurations (pillows, sheets, booms, loose chips, particle beads, and fibers) that may be set in place, or scattered by hand. Preferred sorbents are inert nonreactive clay minerals (neutralizing agents may be added), or specific formulations which provide automatic neutralization or vapor control.

16.3 SPILL CONTROL MEASURES

Stopping the leak or spill at its source may involve turning off pumps or closing valves. Returning a container to an upright position, transferring wastes to other containers, or moving containers to less dangerous locations may, in some circumstances, be possible, but should not be attempted if the identification of the substance is not known unless Level B Protection is worn and decontamination stations have been established. Similarly, the patching of an active leak is not advised until an initial "Size-Up" of the situation is made and guidance established in Section 16.6 has been followed.

16.4 DRUM, CONTAINER, AND TANK HANDLING AND MOVING PROCEDURES

Drums, containers, and/or tanks of hazardous or special waste substances will not be moved until the requirements for preparation have been completed (i.e., all required equipment and materials are at the work site ready for use, and the employees have been familiarized with their responsibilities, the emergency response procedures, and the potential hazards associated with the contents of the drums and containers).

Work site operations will be organized to minimize the amount of drum or container movement. Each drum or container will be inspected before it is moved to ensure that it can be handled without suffering a rupture or puncture, and relocated without having the contents spill or leak.

Unlabeled or unmarked drums and containers will be considered to contain hazardous substances and handled accordingly until the contents are positively

identified and labeled. Drums and containers under pressure, as evidenced by bulging or swelling, will not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosion.

Equipment used to handle the drums and containers will be selected, positioned, operated, and maintained to minimize any contact that could rupture, puncture, dent, or drop drums and containers holding hazardous or special waste substances, and the potential for equipment ignition sources to ignite vapors released from ruptured drums or containers shall be controlled.

Drums and containers that cannot be moved without rupture, leakage or spillage will be transferred to a sound container using a device specified for the material being transferred. During liquid transfer of flammable or combustible liquids, bonding and grounding equipment shall be utilized.

16.5 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS

All emergencies will be promptly reported to the on-site Emergency Response Number (X3300), the Environmental Protection Department (X1132, X3114, or X6160), and to the MK SSHO. The MK SSHO will ensure that the NSWC Site Representative is notified promptly and will direct initial emergency response actions until the arrival of the NSWC Site Representative. The NSWC Site Representative can include the officer in charge of security, fire department and/or ambulance services, or the Environmental Protection Department Manager or designee. Response will be conducted according to NAVSURFWARCENDIVINST 5090.5, Base Oil and Hazardous Substance Spill Contingency Plan.

Initial response actions to be taken by MK personnel and subcontractors at the work site for spill and release emergencies are as follows:

A. Incident Type: Spills or Releases of Hazardous Material

Response Actions:

1. Notify the NSWC Crane Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the person call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and estimate of material released.

2. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. MK SSHO, MK General Superintendent or Subcontractor Job Supervisory assumes initial command of the situation and directs personnel to do one of the following:
 - a. Emergency shutdown of process equipment or mobile equipment, evacuate the work zone or immediate area to a safe place of refuge, and meet the incoming response units and provide all available information.
 - b. Initiate first spill response using available spill response equipment only for small operational spills where personnel are trained to mitigate. Evacuate the work zone or immediate area if there are any health threats or risks to personnel.

17.0 CONFINED SPACES

Permit required confined space entry may be encountered on this project with entry into the sludge beds, pits or sumps, and excavations greater than 5 feet in depth. Entry shall be treated initially as a permit required confined space until atmospheric monitoring is completed and an assessment of physical (eg. excavation stability) and stored energy hazards (eg. intake piping, pumps, etc.) has been documented by a competent person. With documentation of safe atmospheric conditions and controlled physical hazards, the space may be downgraded to alternate entry confined space or non-permit required confined space. Air monitoring shall be continuous unless specified otherwise by the MK SSHO. Engineering controls shall be in place to safeguard any excavation from collapse. Any confined space entry must follow the MK Procedure 9.0 found in the Industrial Hygiene Procedures Manual which is based 29 CFR 1910.146.

Adequate provisions for rescue and emergency medical care must be made prior to entry. Initial emergency rescue response will be provided by the NSWCR Crane Fire Department. The Fire Department shall be notified at least two hours in advance of permit required confined space entry.

TABLES

<p style="text-align: center;">Table 1 Site Description and Contaminants</p>			
Identifier	Location/Description	Scope of Work	Contaminants
SWMU 16/16, Cast High Explosive/Incineration Building	North central part of base, Building 146 area.	Excavation, sampling, and disposal of sludge; containerizing, sampling, and disposal of contaminated soils; cleaning of two sumps and backfilling and restoration of excavated areas.	TNT, RDX, HMX, Comp A and B and ammonium picrate; heavy metals in incineration ash and possibly PCB oxidation products; shell casings, bullets and metallic slag.
SWMU 24/00, Sludge Drying Beds A and B	East central and northwest sections of NSWC.	Excavation sampling, transport and disposal of sludge and the backfilling and restoration of all disturbed areas.	Industrial wastewater sludges contaminated with metals and possibly herbicides and pesticides.

Table 2
Potential Contaminants

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Arsenic	Metal: silver gray or tin white, brittle, odorless solid.	OSHA PEL 10 $\mu\text{g}/\text{m}^3$ as 8-hr. TWA.	Dermal, GI disturbances by skin absorption, peripheral neuropathy and respiratory irritant by direct contact, ingestion causes hyperpigmentation of skin, inhalation causes ulceration of nasal septum.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Aluminum	Metal: silvery, ductile, odorless solid.	OSHA PEL 15 mg/m^3 as 8-hr. TWA for total dust.	Upper respiratory irritant. Reported to have caused pulmonary fibrosis. Relatively inert material.	Provide respiratory support.
Antimony	Metal: silver-white, lustrous, hard, brittle solid; scale like crystals; or a dark gray, lustrous powder.	OSHA PEL 0.5 mg/m^3 as 8-hr. TWA.	Irritant to nose, throat and mouth by inhalation. Skin or eye contact causes cough; dizziness; stomach cramps and unable to smell properly.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Barium	White odorless solids, soluble compounds may be liquid compounds.	OSHA PEL 10 mg/m^3 as 8-hr. TWA.	Upper respiratory irritant. Irritant to eyes and skin. Ingestion causes gastroenteritis, muscle spasm.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Beryllium	Metal: a hard brittle, grey-white solid.	OSHA PEL 2 $\mu\text{g}/\text{m}^3$ as 8-hr. TWA.	Irritant to eyes and mucous membranes, causes respiratory symptoms, weakness, fatigue and weight loss.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Cadmium	Metal: silver-white, blue-tinged lustrous, odorless solid.	OSHA PEL 2.5 $\mu\text{g}/\text{m}^3$ as 8-hr. TWA.	Inhalation causes pulmonary edema, dyspnea, cough and chest pain. Ingestion causes chills, muscle aches, nausea, vomiting and diarrhea.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.

Table 2
Potential Contaminants

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Chromium metal	Blue white to steel gray, lustrous, brittle, hard solid.	OSHA PEL 0.5 mg/m ³ as 8-hr. TWA	Histologic fibrosis of lungs by inhalation. Causes sensitive dermatitis. Poison by ingestion.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
Copper metal dusts and mists	Metal: reddish, lustrous, malleable, odorless solid.	OSHA PEL 1 mg/m ³ as 8-hr. TWA	Irritant to the nasal mucous membranes and pharynx; may cause nasal perforation; eye irritant; metallic taste; dermatitis.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
Iron (oxides)	Reddish brown solid.	OSHA PEL 5 mg/m ³ as 8-hr. TWA	Relatively inert material. Repeated exposures by inhalation can cause benign pneumoconiosis.	Provide respiratory support.
Inorganic Lead	A heavy, ductile, soft grey solid. Noncombustible solid. (May be in soil as a biodegraded product of leaded gasoline.	OSHA PEL 50 µg/m ³ as 8-hr. TWA	Weakness, lassitude, and insomnia. Facial pallor, anorexia, low weight, and malnutrition. Constipation, abdominal pain and colitis. Anemia, gingival lead line, tremor, Encephalopathy, Nephropathy. Irritant to eyes. Hypertension.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
PCBs, Aroclor 1242, 1254 and 1260	Colorless to brown liquid with mild hydro-carbon odor	OSHA PEL 0.5 mg/m ³	Irritant to eyes and skin. Acne form dermatitis, jaundice, dark urine.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
HMX (Cyclotetramethylenetetra-nitramine) See Note 1				

Table 2
Potential Contaminants

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
RDX (Cyclonite)	White crystalline powder, combustible solid.	OSHA PEL 1.5 mg/m ³ as 8-hr. ACGIH 8-hr. TWA of 1.5 mg/m ³	Skin, eye and respiratory irritations. Very similar to TNT.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
TNT (Trinitrotoluene)	Colorless to pale yellow, odorless solid or crushed flakes. Combustible solid.	OSHA PEL 1.5 mg/m ³ as 8-hr. TWA, ACGIH 8-hr. TWA of 0.5 mg/m ³	Causes liver damage, jaundice; cyanosis; sneezing; cough; sore throat; peripheral neuropathy; muscle pain, kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia and cardiac irregularities.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.

Note: Data is derived from NIOSH 1990; OSHA 1994; and ACGIH 1994-1995.

Note 1: Significant data not found, similar concerns as compared to TNT.

Note 2: Additional data to be added to table as revision 1 concerning Composition A and B plus ammonium picrate. Clean Contractor soil and ash analytical data in *RFI Phase II Soils Report for Rockeye, SWMU #10/15* (ACOE 1992) shows the above contaminants as the most probable. Mercury was listed as a contaminant in very low concentrations, and is probably a mercury salt as a by-product of the incineration and relatively inert.

Table 3
Personnel Names and Telephone Numbers

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone</u>
Robert Hlavacek	MK Program Manager (MK PMO)	(803) 554-9367
Scott Newman	MK Senior Project Engineer (MK PMO)	(803) 554-9369
Tom Payne	MK Project Manager at NSWC Crane	Office: (812) 854-6941
Robert Porter	MK Site General Superintendent	Office: (812) 854-6941
Elvin Graves	MK Site Safety and Health Officer	Office: (812) 854-6941 Cellular: (812) 639-8356, two way radio designation: Unit 0004
Steve Downey	MK Project Engineer	Office: (812) 854-6941
Jerry Smith	MK Site Quality Control Officer	Office: (812) 854-6941
Willy Piispanen	MK Health and Safety Program Manager	(208) 386-5930
Cmdr. Larry Laws	NSWC Crane PWD/Eng. Dept	(812) 854-1834
Capt. J.M. Carney	NSWC Base Commander	(812) 854-1210
Jim Hunsicker or Tom Brent	NSWC Environmental Protection Services	(812) 854-6160
Adrienne Townsel-Wilson	SOUTHNAVFACENGCOM	803-743-0582
Brent Robertson	ROICC(NTR)	(812) 854-3318
Law Enforcement	NSWC Security (Base)	3300 emergency
Fire Department	NSWC Fire Department (Base)	3300 emergency (812) 854-1235
Lt. Dale Eads	NSWC E.O.D. (Base)	(812) 854-3456
Ambulance Service	NSWC Ambulance (Base)	3300 emergency (812) 854-1100
Dale Groh	NSWC Safety Directory	(812) 854-3601
Poison Control Center	Poison Control Center	(800) 942-5969
National Response Center	National Response Center	(800) 424-8802
Regional USEPA Emergency	USEPA (Region 5)	(910) 221-5191
Hospital	NSWC Base Medical Facility Head Nurse (Mary Muessig)	(812) 854-1220 (812) 854-4319

Table 3
Personnel Names and Telephone Numbers

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone</u>
Hospital	Bedford Medical Center 2900 West 16 th Street Bedford, IN 47432	(812) 275-1200
Hospital	Bloomington Hospital 601 West Second Street Bloomington, IN	(812) 336-9515
Utility Locator Service	Public Works Dept.	(812) 854-1834

Directions to NSWC Medical Department On-site:

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of H-2 just north of H-5.

Directions to Bedford Medical Center:

From Bloomington Gate, head east on Highway 58 to the city of Bedford, then turn left onto 16th Street. Distance to hospital is approximately 20 miles.

Directions to Bloomington Hospital:

Exit NSWC Crane on H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead over the bypass (Bloomfield Road), and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street and the hospital will be on right-hand side of the road.

Note: SSHO is to make sure Table 3 and Figure 3 are included with the Work Zone Maps posted at the job site. In addition, Table 3 and Figure 3 must be posted at each office location. Table 3 must be updated to include all subcontractor points-of-contact.

Notify the SSHO of any changes in work conditions which may affect the health and safety aspects of the task. The Superintendents or designated supervisors are responsible for conducting Plan-of-the-Day meetings, Pre-Entry and Post-Entry Briefings, weekly safety meetings, and conducting or ensuring that other training is completed.

**Table 4
Training Requirements**

Identifier	Location	40 Hr. Haz. Waste	Haz. Waste Annual Ref.	Haz. Waste Supervisor	Weekly Safety Mitg.	Haz. Com.	Metals	CPR/ First Aid	Respira- tory Protec- tion	Confined Space	Site Specific	POD, Pre- & Post- Entry Brief	Other
SWMU 16/16	Cast High Explosive/ Incineration Building	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ³
SWMU 24/00	Sludge Drying Beds A and B	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ³
Sampling	All locations	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ^{3,4}

Y = Yes, N = No

Notes:

- 1 - Competent person per 29 CFR 1926.62 and employee hazard communication on lead; employee hazard communication on cadmium per 1926.1127, hazard communication on inorganic arsenic per 1926.1118. Employee hazard communication on the other metals per MK IH Manual Procedure 12.
- 2 - Excavations greater than 5 feet in depth should be treated as permit required confined spaces until atmospheric monitoring proves it can be downgraded to non permit required confined space and engineering controls on excavation design are in place.
- 3 - Competent person per 29 CFR 1926, subpart P, Excavations.
- 4 - 49 CFR Part 172 Subpart H for personnel required to classify, mark, select packaging, inspect, load and transport hazardous materials.

Table 5
Selection of Personal Protective Equipment

PPE	Level D	Modified Level D	Level C	Level B
Coveralls or other approved working apparel	Yes	Optional	Optional	Optional
Chemical-resistant clothing (coveralls; hooded, one- or two-piece chemical-resistant coveralls)		Yes		
Chemical-resistant clothing (coveralls; hooded one- or two-piece chemical splash suit; chemical-resistant hood and apron; disposal chemical-resistant coveralls)			Yes	
Chemical-resistant clothing (coveralls and long-sleeved jacket; one- or two-piece chemical splash suit; disposal chemical-resistant one-piece suit)				Yes
Boots, leather or chemical resistant, steel protective toe (29 CFR 1926.28, 1910.136 and ANSI Z41-1991).	Yes			
Boots (inner), chemical resistant, protective toe and shank meeting ANSI Z41.1 (29 CFR 1926.28(a)).		Yes	Yes	Yes
Boot covers (outer), chemical resistant (disposable)		Optional	Optional	Optional
Safety glasses or chemical splash goggles (29 CFR 1910.133, ANSI Z87.1-1989, and 1926.102)	Yes	Yes	Yes *1	
Face shield (29 CFR 1910.133, ANSI Z87.1-1989, and 1926.102)	Optional	Optional	Optional	Optional
Gloves (cotton/leather)	Optional			
Gloves (inner), chemical resistant or liners		Optional	Yes	Yes
Gloves (outer), chemical resistant		Yes	Yes	Yes
Long underwear		Optional	Optional	Optional
Hardhat (29 CFR 1926.100, 1910.135, ANSI Z89.1-1969 and ANSI Z89.2-1971)	Yes	Yes	Yes	Yes
Positive pressure, full-facepiece with nose cup, self-contained breathing apparatus (SCBA) or positive pressure, supplied-air respirator with escape SCBA (MSHA or NIOSH approved) (Note: escape SCBA may not be required)				Yes
Air-purifying respirator, half-face or full face with suitable cartridge (MSHA or NIOSH approved)			Yes	
Note: Optional requirements to be determined by SSHO based on Activity Hazard Analysis. *1 = not required with full face respirator mask.				

Table 6
Minimum Personal Protective Equipment Requirements by Task

Site	Activity	PPE
SWMU 16/16	<ol style="list-style-type: none"> 1. Configure and set up work area. 2. Preliminary screening of debris. 3. Hand excavation. 4. Mechanical excavation. 5. High Pressure Wash, Sump Walls 6. Soil packaging. 7. Decontamination. 8. Site restoration. 	<ol style="list-style-type: none"> 1. Level C, modify where necessary 2. Level C, modify where necessary 3. Level C, modify where necessary 4. Level C, modify where necessary 5. Level C, modify where necessary 6. Level D 7. Level C, modify where necessary 8. Level D
SWMU 24/00	<ol style="list-style-type: none"> 1. Configure and set up work area. 2. Preliminary screening of debris. 3. Hand excavation. 4. Mechanical excavation. 5. High Pressure Wash, Sump Walls 6. Soil/Sludge packaging. 7. Decontamination. 8. Site restoration. 	<ol style="list-style-type: none"> 1. Level C, modify where necessary 2. Level C, modify where necessary 3. Level C, modify where necessary 4. Level C, modify where necessary 5. Level C, modify where necessary 6. Level D 7. Level C, modify where necessary 8. Level D
Sampling at all locations	<ol style="list-style-type: none"> 1. Obtain soil and sludge and/or groundwater samples 	<ol style="list-style-type: none"> 1. Modified Level D, modify where necessary

Table 7
Airborne Contaminant Response Criteria

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Volatile organic compounds	No more than 5 ppm above background, no benzene detected	Level D or modified Level D	Prior to each shift and reentry following 30 minute vacancy or as warranted	Continue periodic monitoring
	Greater than 5 ppm above background but less than 10 ppm above background. No benzene detected, no Action Level for any organic exceeded.	Level D or Modified Level D	At least once every hour, when change in operation occurs, or when requested by workers	Monitor for benzene or other organics. Continue periodic monitoring
	Greater than 10 ppm above background or benzene detected or Action Level exceeded for any organic.	To be determined by SSHO	To be determined by SSHO	Stop work and notify SSHO
Lead (inorganic)	Less than action level for lead (30 $\mu\text{g}/\text{m}^3$) and/or no visible observation of excessive dusts	Modified Level D or Level D	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	Level C or as determined by SSHO	Representative personnel sampling and monitoring to be conducted or continued	Stop work and notify SSHO
	Greater than OSHA PEL or greater than 10 mg/m^3 total dust.	As determined by SSHO	Representative personnel sampling and monitoring to be conducted or continued	Stop work and notify SSHO

Table 7
Airborne Contaminant Response Criteria

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Volatile organic compounds	No more than 5 ppm above background, no benzene detected	Level D or modified Level D	Prior to each shift and reentry following 30 minute vacancy or as warranted	Continue periodic monitoring
Oxygen	Less than 19.5%	To be determined by SSHO	To be determined by SSHO	Stop work, exit area and immediately notify SSHO
Arsenic (inorganic)	Less than action level for arsenic (inorganic) of (5 $\mu\text{g}/\text{m}^3$) and/or no visible observation of excessive dusts	Modified Level D or Level D	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m^3 total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
Cadmium	Less than action level for cadmium of (2.5 $\mu\text{g}/\text{m}^3$) and/or no visible observation of excessive dusts	Modified Level D or Level D	Periodic per plan	Continue monitoring and/or sampling and observations

Table 7
Airborne Contaminant Response Criteria

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Volatile organic compounds	No more than 5 ppm above background, no benzene detected	Level D or modified Level D	Prior to each shift and reentry following 30 minute vacancy or as warranted	Continue periodic monitoring
Cadmium	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
Explosives Residues	Less than the action level for the explosive compound having the lowest action level (DNB, 0.5 mg/m ³) and/or no visible observation of excessive dusts	Modified Level D or Level D	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO

Table 7
Airborne Contaminant Response Criteria

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Volatile organic compounds	No more than 5 ppm above background, no benzene detected	Level D or modified Level D	Prior to each shift and reentry following 30 minute vacancy or as warranted	Continue periodic monitoring
Hydrogen Sulfide	Greater than 10 ppm	To be determined by SSHO	Prior to each shift and reentry following 30 minute vacancy or as warranted. Continuous in excavations	Stop work and notify SSHO
% LEL	Equal to or greater than 10%.	To be determined by SSHO	To be determined by SSHO	Stop work, shut off equipment, remove ignition sources if safe to do so; notify SSHO

Table 8
Suggested Frequency of Physiological Monitoring for
Fit and Acclimatized Workers^a

ADJUSTED TEMPERATURE ^b	IMPERMEABLE ENSEMBLE
90°F (32.2°C) or above	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 120 minutes of work

^aFor work levels of 250 kilocalories/hour.

^bCalculate the adjusted air temperature (ta adj) by using this equation:

$$ta \text{ adj } ^\circ F = ta^\circ F + (13 \times \% \text{ sunshine}).$$

Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow.

(100 percent sunshine = no cloud cover and a sharp, distinct shadow: 0 percent sunshine = no shadows.)

Note: Reprinted from NIOSH/OSHA/USCG/EPA October 1985.

Table 9
Monitoring and Sampling Requirements

Site	Activity	Monitor						Sample		
		VOC	Dust	Oxygen, H ₂ S and % LEL	Perimeter (VOCs /Dust)	Noise	Heat Stress	VOC	Metals	Explo- sives
SWMU 16/16	1. Configure and set up work area.	O	O	O	O	O	O	N	N	N
	2. Preliminary screening of debris.	O	O	O	O	O	O	O	O	O
	3. Hand excavation.	O	O	Y	O	N	O	O	Y	Y
	4. Mechanical excavation.	O	Y	Y	O	Y	O	O	O	O
	5. High Pressure Wash, Sump Walls	O	Y	Y	O	Y	O	O	Y	Y
	6. Soil packaging.									
	7. Decontamination.	O	O	O	O	O	O	O	O	O
	8. Site restoration.	O	Y	N	O	O	O	N	O	O
SWMU 24/00	1. Configure and set up work area.	same as 16/16	same as 16/16	same as 16/16	same as 16/16	same as 16/16	same as 16/16	same as 16/16	same as 16/16	None
	2. Preliminary screening of debris.									
	3. Hand excavation.									
	4. Mechanical excavation.									
	5. High Pressure Wash, Sump Walls									
	6. Soil/Sludge packaging.									
	7. Decontamination.									
	8. Site restoration.									
Sampl- ing	1. Obtain soil/sludge and groundwater samples	Y ¹	N	Y ¹	N	N	N	N	N	N

Y = Yes, O = Optional at discretion of SSHO, N = Not required

¹ = When obtaining soil samples in excavations deeper than 5 feet, treat the excavation as permit required confined space until it has been assessed by atmospheric monitoring that the atmosphere is safe and it can be downgraded to non permit required confined space. Engineering controls must be in place to safeguard excavation from collapse.

FIGURES

**MORRISON KNUDSEN CORPORATION**
ENGINEERING, CONSTRUCTION, AND ENVIRONMENTAL GROUP**EXCAVATION AND TRENCHING PERMIT**

(OSHA Section 1926.650)

DATE:	TIME:	DATE EXPIRES
-------	-------	--------------

JOB DESCRIPTION AND LOCATION (Be Specific):

BEFORE TRENCHING AND EXCAVATION

<input type="checkbox"/> Soil Classification <div style="margin-left: 20px;"><input type="checkbox"/> Stable Rock <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type C</div> <input type="checkbox"/> Check For Proximity To Utilities, Buildings, Footing or Pilings and Sources of Vibrations. <input type="checkbox"/> Owners of Utilities, Services or Transmission Piping, Etc. (Electrical, Telephone, Water, Sewer)	<input type="checkbox"/> Check For Previously Disturbed Ground <input type="checkbox"/> Adequacy and Availability of All Equipment, Including Personal Protective Gear, Shoring Material, Signs, Barricades and Machinery. <input type="checkbox"/> Other Known Obstructions (e.g. Footing Concrete Encasement) <input type="checkbox"/> Allowable Slope.
---	--

COMMENTS:

DURING TRENCHING AND EXCAVATION

<input type="checkbox"/> Size of Excavation Depth _____ Width _____ Length _____ <input type="checkbox"/> Changing Ground Conditions, Particularly After Rain Fall <input type="checkbox"/> Monitor For Possible Oxygen Deficiency Or Gaseous Conditions. (Record per IH Manual Procedure 5.0 or equivalent). <input type="checkbox"/> Adequacy of Shoring And/Or Sloping As Work Progresses. <input type="checkbox"/> Entrances and Exit Facilities <input type="checkbox"/> Stairway <input type="checkbox"/> Ladders <input type="checkbox"/> Ramp <input type="checkbox"/> Change In Vehicular and Machinery Operation <input type="checkbox"/> Water Removal Equipment and Operation <input type="checkbox"/> Adequacy of Portable Trench Boxes or Trench Shields	<input type="checkbox"/> Protective Systems Depth of A Trench Or Excavation of 5 Feet or More. <u>Check The Applicable OSHA Appendix Below:</u> <input type="checkbox"/> B - Sloping and Benching <div style="margin-left: 40px;">Maximum Allowable Slopes Stable Rock Vertical (90°) Type A 3/4:1 (53°) Type B 1:1 (45°) Type C 1 1/2:1 (34°)</div> NOTE: Sloping or Benching For Excavations Greater Than 20 Feet Deep Shall Be Designed By A State Registered Professional Engineer (RPE). <input type="checkbox"/> C - Timber Shoring For Trenches <input type="checkbox"/> D - Aluminum Hydraulic Shoring For Trenching <input type="checkbox"/> RPE - Designed Protection Systems (data must be filed on job-site)
---	--

COMMENTS:

SIGNATURES AND DATES

COMPETENT PERSON:	SSHO:	PROJECT MANAGER:
CLIENT REPRESENTATIVE:	CIVIL ENGINEER:	CIVIL SUPERINTENDENT:
EQUIPMENT OPERATOR:	SUBCONTRACTOR REP:	OTHER APPROVAL:

Figure 2 Hot Work Permit


MORRISON KNUDSEN CORPORATION
 ENGINEERING, CONSTRUCTION, AND ENVIRONMENTAL GROUP
HOT WORK PERMIT

Issued to:	Responsible Person:	Date:
Building:	Area Equipment	Control No.
Special Work To Be Done:		Time From/To:
Please check appropriate response		YES NO N/A
1. Has affected personnel been briefed on job safety & requirements?		
2. Has equipment been properly prepared for this work?		
3. Does other work or processes affect this work?		
4. Has fire detection and/or gas systems been isolated?		
5. Is the work area clean and ready for work to begin?		
6. Has isolation lockout been completed? If so, record lock and tag numbers below.		
7. Has fire watch been assigned with appropriate equipment? Name(s)		
8. Is GAS TEST required? <input type="checkbox"/> Yes <input type="checkbox"/> No Test Results Percent LEL O ₂ H ₂ S, CO, other toxic		Time Tester
Continuous? <input type="checkbox"/> Yes <input type="checkbox"/> No Total Hydrocarbons Others As Req.		
Remarks:		
Special Instructions: <input type="checkbox"/> Yes <input type="checkbox"/> No	Lock Numbers	Tag Numbers
Job Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No	Time/Initial:	Permit Cancelled: (Time)

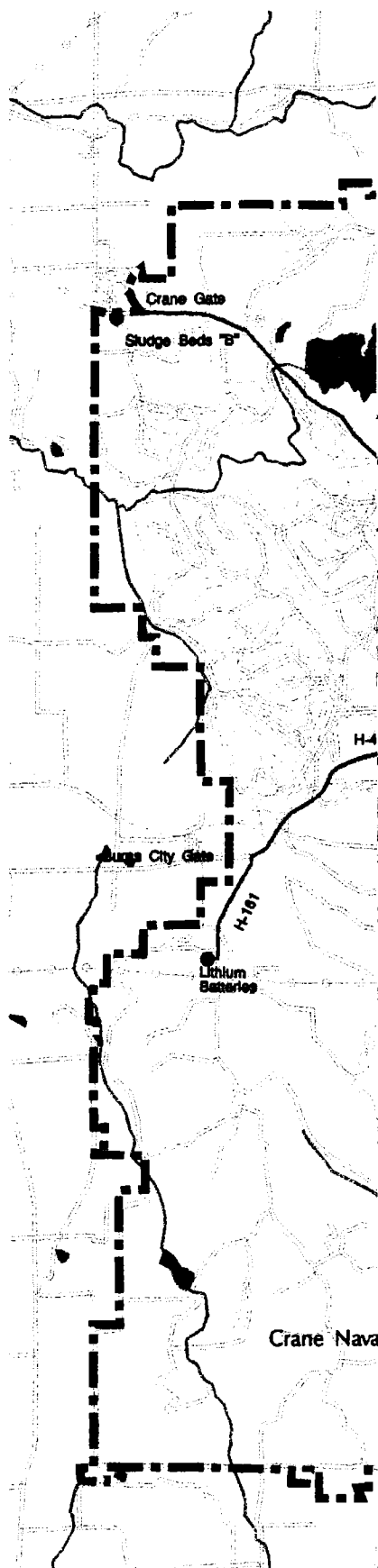
Endorsements as Required

Area Operations Technician:	Signature/Name:	Time:
Person Doing The Work:		
Job Supervisor/Foreman:		
Project Supervisor:		
SSHO (Safety)		

Figure 3 Directions to Nearest Emergency Medical Facilities

Figure 3

**Directions to the Nearest
Medical Facility**



Legend

- Primary Route

- Naval Reservation Boundary

to NSWC Medical Department on site:

NSWC Medical Department manages and coordinates the ambulance service. Located in Building 12 off of north of H-5.

to Bedford Medical Center:

In Gate, head east on Highway 58 to the city of Bedford. Distance to hospital is approximately 20 miles.

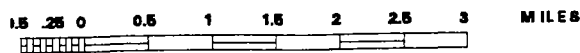
At Bedford Gate, head east on I58 to the city of Bedford. Distance to 16th street.

to Bloomington Hospital:

On H5-45 through the Bloomington Gate, follow Highway 45 North to Bloomington. At Highway 45 and Highway 100, go straight over the bypass (Bloomfield Road), then turn north which turns into 2nd Street. The hospital is on your right.



1 inch = 1.5 miles



MORRISON KNUDSEN CORPORATION
Engineering, Construction
& Environmental Group

Figure 4 Pre-Entry Briefing Signature Sheet

Work area(s) to be entered _____.

The following personnel have had a pre-site entry briefing conducted at _____ (time) on _____ (date) at _____ (location), and are familiar with this plan's provisions, and are willing to meet the requirements of this plan.

NAME	SIGNATURE	ORGANIZATION
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Printed Name of Supervisor

Signature

Date

Figure 4a Meeting Signature Sheet

Type of Meeting: _____

Topic: _____

The following personnel were present for meeting conducted at _____
(time) on _____ (date) at _____ (location).

NAME	SIGNATURE	ORGANIZATION
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Printed Name of Supervisor _____

Signature _____

Date _____

Figure 5 SSHO Daily Logbook Report

Page ____ of ____

Date _____ Report Number _____

Location(s) Work Activity and # Employees: _____

Weather: Wind speed _____ Wind direction _____
 Temp & Pressure _____ Precipitation _____
 Amount sun _____

Monitoring conducted:			Instrument	Sampled
<u>Location</u>	<u>By/Time</u>	<u>Sampled for</u>	<u>used</u>	<u>Results</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Levels of Protection: _____

Problems or Unusual Situations: _____

Correspondence: _____

Other Comments: _____

MK SSHO Printed Name: _____ Signature _____ Date _____

Figure 6 SSHP Weekly Inspection Checklist

Surveillance No. _____

SURVEILLANCE NO:		ACTIVITY:				PROJECT NO:	
DATE:		LOCATION:				SURVEYED ORGANIZATION: PRIME:	
		SITE/AREA CONTACT:		RESPONSIBLE MANAGER:			
						SUBTIER:	

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
	Section 1						
1	Scope of work and site contaminants accurately described?						
	Section 2						
2	Activity hazard analysis prepared for each major work phase? (EM 385-1-1, Section 01.A.09)						
3	All hazards including chemical and physical adequately described?						
	Section 3						
4	Roles and responsibilities described and personnel roster up-to-date?						
	Section 4						
5	All site personnel completed required training?						
6	Training documented and records on site?						
	Section 5						
7	All site personnel completed initial medial qualification?						
	Section 6						
8	PPE available and in good condition?						
9	PPE work per SSHP and/or SSHO direction?						
10	Personnel trained in proper use, limitations, and inspection of PPE?						

Figure 6 SSHP Weekly Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
11	PPE inspected per SSHP?						
12	PPE donning/doffing procedures in place?						
13	Written SOP available describing respirator selection and use?						
	Section 7						
14	Air monitoring conducted per SSHP?						
15	Monitoring equipment properly maintained and calibrated?						
16	Employees notified of monitoring results?						
17	Chain of custody prepared and maintained for all samples?						
	Section 8						
18	Weekly safety meeting held?						
19	Pre-entry briefs held? and signature sheet completed?						
20	Haz Com programs in place?						
21	Competent person evaluates excavation?						
22	Personnel responsible for work maintain control of area?						
	Section 9						
23	Work zone maps prepared and updated?						
24	Maps posted near work area and stored in SSHP?						
25	Traffic patterns established and rules observed?						
	Section 10						
26	Inspections performed of all personnel, clothing and equipment leaving exclusion zone?						

Figure 6 SSHP Weekly Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
27	All materials decontaminated prior to existing contamination reduction zone?						
28	Decon stations properly established?						
29	Proper personal hygiene practices observed?						
30	Decon solutions collected and properly disposed of?						
	Section 11						
31	At least two employees on each shift trained in CPR and first aid?						
32	First aid kit at each work site?						
33	All first aid and medical cases promptly reported to SSHO?						
	Section 12						
34	All personnel trained on Emergency Response Plan and Contingency Procedures?						
35	Emergency pre-planning addressed in safety meeting?						
36	List of emergency services/contact is up to date and posted?						
37	Assembly points identified and communicated to employees?						
38	Evacuation routes established and communicated to employees?						
39	Communication methods are adequate						
40	All drills, exercises, and emergencies critiqued?						
41	All emergencies promptly reported to SSHO?						
	Section 13						
42	SSHO maintains project log book?						
43	Daily reports completed by SSHO?						

Figure 6 SSHP Weekly Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DISCREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
44	Daily inspections completed by SSHO?						
45	Weekly reports prepared by SSHO?						
46	Records of all injuries and illnesses maintained by SSHO?						
	Section 14						
47	Work plans available and up to date?						
48	SOPs developed as needed?						
	Section 15						
49	Two-way radios available per SSHP?						
50	Cellular telephone available as needed?						
51	Emergency alarms available and personnel trained on what actions to take?						
52	Drills and exercises conducted to test communication methods?						
	Section 16						
53	Spill response measures reviewed with personnel?						
54	Suitable quantities of spill supplies available?						
55	Spills promptly reported to SSHO?						
56	Operations arranged to minimize spills?						
	Section 17						
57	Confined space requirements of 385-1-1, Section 06.0.01 followed? Personnel trained?						

Inspection Performed By: _____ Date: _____

Abatement Accepted By: _____ Date: _____

APPENDIX A

ACTIVITY HAZARD ANALYSIS (AHA)

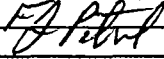
ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Configure and set up work areas.		Analyzed By/Date: Frank J. Petrik 8/17/95 <i>FD Petrik 8/17/95</i>	Reviewed By/Date:
1.0 Principal Steps	Potential Hazards	Recommended Controls	
<p>1.1 Walk area down, establish work zone and laydown areas.</p> <p>1.2 Clearing and grubbing.</p>	<p>1.1a. Struck by and struck against physical objects during loading and unloading operations and setup.</p> <p>1.1b. Biological; weeds, snakes, spider's; other plant life.</p> <p>1.1c. Contact by inhalation, direct contact or ingestion of chemical contaminants.</p> <p>1.2a. Struck by and struck against physical objects during clearing and grubbing.</p> <p>1.2b. Contact with debris resulting in inhalation, direct contact or ingestion of chemical contaminants.</p>	<p>1.1a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. Use correct hand and power tools for job and good housekeeping practices.</p> <p>Note: MK PM to coordinate the unexploded ordnance survey (UXO) in the work zone areas with the NSWC contact.</p> <p>1.1b. MK SSHO to discuss specific biological hazards awareness and communicate findings at POD and/or Pre Entry Briefs.</p> <p>1.1c. Level C initially, modify as necessary. MK SSHO to visual inspect area for evidence of contaminants and will also conduct general area scans for VOCs using PID and FID.</p> <p>1.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. Use correct handtools and power equipment for the job. Review EM 385-1-1 Section 31 on safeguards and recommended practices.</p> <p>1.2b. Level C PPE for clearing and grubbing. Level C PPE for preliminary screening of debris. Modify PPE levels as conditions warrant.</p>	
1.3 Equipment to be Used	Inspection Requirements	Training Requirements	
<p>1.4 Heavy equipment for loading and hauling. Hand and power tools.</p>	<p>Daily, prior to use per manufacturer's recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication, Respirator.</p>	

ACTIVITY HAZARD ANALYSIS (AHA)			
Activity: Hand and Mechanical excavating.		Analyzed By/Date: Frank J. Petrik 8/17/95 <i>FJ Petrik</i>	Reviewed By/Date:
2.0 Principal Steps	Potential Hazards	Recommended Controls	
2.1 Hand excavations 2.2 Mechanical excavation.	<p>Contact with underground utilities and process connections and other objects not expected in the burial area.</p> <p>Inhalation, direct contact or ingestion of chemical, biological and physical agents.</p> <p>Struck by and struck against physical objects during excavations.</p>	<p>MK Excavation and Trenching permit required. Confirm if any utilities in area and the need for energy control on sump equipment. Confined space entry procedures if excavated areas to be entered. UXO personnel required to be observing excavation.</p> <p>Level C PPE during excavating, upgrade or downgrade per SSHO direction. SSHO to conduct periodic air monitoring for VOCs, LEL, O₂, H₂S and other toxic gases.</p> <p>Maintain clear area around heavy equipment. Competent person shall inspect excavation on a periodic basis.</p>	
2.3 Equipment to be Used	Inspection Requirements	Training Requirements	
2.4 Heavy equipment and handtools.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication, Respirator and Operator Training.	

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Handling and Staging of Debris		Analyzed By/Date: Frank J. Petrik 8/17/95 <i>FJ Petrik</i>
Reviewed By/Date:		
3.0 Principal Steps	Potential Hazards	Recommended Controls
3.1 Complete final clean-off of debris. 3.2 Load debris onto staging area.	Physical hazards related to the lifting, moving and loading of debris. Direct contact with any contaminated material which is removable from surface.	UXO personnel assigned to observe and evaluate objects uncovered. Preplan the staging area layout and flow of material. Preplan all lifts and verify safe loading factors and correct rigging for equipment. Level C PPE, downgrade per SSHO direction.
3.3 Equipment to be Used	Inspection Requirements	Training Requirements
3.4 Heavy equipment, slinging and rigging, overpack containers, handtools.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication and Respirator.

Note: Debris expected to be encountered in any excavation area includes bullets, shell casings and metallic slag.

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Decontamination Facility Operations, Personnel and Equipment and decontamination of slump walls.		Analyzed By/Date: Frank J. Petrik 8/17/95 
		Reviewed By/Date: _____
4.0 Principal Steps	Potential Hazards	Recommended Controls
4.1 Receive and place material at facility. 4.2 Decontaminate Equipment using high pressure wash or hand scrubbing and/or automatic wash on vehicle tires and undercarriage. 4.3 Decontaminate sump walls using high pressure wash.	4.1a. Struck by and struck against. Material handling concerns. 4.2a. Contact with contaminated material and cross contamination; inhalation of airborne aerosols; contact with high pressure wash stream; unexpected movement of material to be decontaminated. 4.3a. Contact with contaminated material and cross contamination; inhalation of airborne aerosols and contact with high pressure wash stream.	4.1a. Site Decontamination Facility to provide isolation and controlled access. MK SSHO and Project Supervisor(s) to review material handling procedures to insure good practices and approved equipment is used which conforms to OSHA and EM-381 Section 28.1 requirements. 4.2a. Level C PPE with faceshield, modify per SSHO review. Secure items to be decontaminated. Visual inspect integrity of Facility's containment liners and containers used for waste waters. Clean side area established for worker's street clothes and approved respirator storage after cleaning and sanitizing. 4.3a. Level C PPE. Confined Space Entry procedures if excavated sumps to be entered. Energy control if applicable.
4.3 Equipment to be Used	Inspection Requirements	Training Requirements
4.4 High pressure wash with soap solution; other decontamination solutions; scrub brushes; material handling equipment and securing equipment.	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication, and Respirator.

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Backfilling and Site Restoration.	Analyzed By/Date: Frank J. Petrik 8/17/95 <i>FJ Petrik</i>	Reviewed By/Date:
5.0 Principal Steps	Potential Hazards	Recommended Controls
5.1 Offload, spread, compact and reseed area.	5.1a. Contact with airborne treated material, may present a biological hazard. 5.1b. Struck by and struck against physical objects during offloading and spreading material. 5.1c. Vibration from compactor, electric or air source.	5.1a. Dust Controls required to include wetting fill material. Level D PPE expected, upgrade if necessary. Dust controls and respirator (dust mask) may be necessary during spreading and covering with cover material (spray on straw) 5.1b. Preplan work layout. Backup alarms on all motorized equipment. Keep clear area around heavy equipment. 5.1c. Equipment operated per manufacturers recommendation. May require heavy work glove for vibration dampening and hearing protection for noise mitigation.
5.2 Equipment to be Used	Inspection Requirements	Training Requirements
5.3 Heavy equipment, hand-tools, sodding equipment, straw spreader, compactor.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication, Respirator.

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Field Sampling Activities for Soil.		Analyzed By/Date: Frank J. Petrik 8/17/95 <i>FJ Petrik</i>
		Reviewed By/Date:
6.0. Principal Steps	Potential Hazards	Recommended Controls
6.1. Hand augering (in excavations) 6.2. Hand augering (non excavated areas) 6.3. Containerized Liquids Sampling (known contents) 6.4. Sampling Equipment Decontamination	6.1a. Collapse of excavation, entrance and egress, contaminated soil contact, contact with underground utility or piping/mechanical system. 6.2a. Contaminated soil contact, contact with utility or piping/mechanical system. 6.3a. Contaminated liquid contact. 6.4a. Contact with contaminated material, also direct contact with decontamination solutions (weak nitric acid and acetone)	6.1a. Sampler requires approval from competent person to enter excavation if deeper than 5 foot. Atmospheric conditions in excavation checked prior to and during sampling. Modified Level D PPE expected, upgrade per SSHO review. Analyze for potential contact with any underground utility or mechanical service. Note: Excavation Permit must be valid. Review Field Sampling Kit MSDSs. 6.2a. Excavation/Trenching Permit required for sampling, analyze for potential contact with any underground utility or mechanical service. Modified Level D PPE expected, upgrade per SSHO review. Review Field Sampling Kit MSDSs, add MSDS to project files. 6.3a. Level D+ PPE. 6.4a. Level D+ PPE with splash goggles and chemical gloves.
6.5 Equipment to be Used	Inspection Requirements	Training Requirements
6.6. Soil auger, stainless steel spoons, buckets, field sampling kits and decontamination solutions.	Per manufacturers recommendation. Core drilling equipment if used must be inspected daily. Preplan waste handling.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8-hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre- and Post-Entry Briefs, OSHA Hazard Communication, Respirator. DOT 181 certification for person supervising the preparation of contaminated materials for offsite shipment.

APPENDIX B

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheets (MSDSs) or NIOSH Pocket Guide Summaries are provided for the known or expected contaminants. The list will be updated as the project progresses. MSDS and/or NIOSH Pocket Guides will be added to a Site MSDS (Right-To-Know) Binder instead of this Appendix.

APPENDIX C

WORK ZONE MAPS

Note: Work Zone Maps are field prepared by the Subcontractor and approved by the MK SSHO. The Excavation Subcontractor will deliver one set of the Work Zone Maps to the MK SSHO who will insert copies of the map(s) into the field master copy of this SSHP.